# ONEOS V4.2R5

# IBC ADMINISTRATOR'S & USER'S GUIDE

EDITION 4

OneAccess Networks

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# 1 INTRODUCTION

IBC stands for IP Business Communication. The IBC module is a voice application empowering OneOS to deliver advanced voice features to a wide variety of phone subscribers: analog and ISDN phone, PBX trunks, SIP phones (wired, wireless and dual-mode).

The present manual is divided into two parts:

- A user's guide: describing briefly the services offered by voice features and how to activate/de-activate/use them.
- An administrator's guide: deals with advanced voice feature description, user provisioning, service configuration and monitoring.

## 1.1 FEATURE MATRIX

| Main Function | Feature | Present at least in Version: |
|---|---|---|
| **Trunk Interface** | ISDN BRI / PRI | V4.1R1 |
| | FXO | V4.1R1 |
| | H.323 | V4.1R1 |
| | Backup routing of H.323 to FXO/ISDN trunk | V4.1R1 |
| **Subscribers** | FXS phones | V4.1R1 |
| | ISDN phones | V4.1R1 |
| | SIP phones | V4.1R1 |
| | MAC-based SIP phone authentication | V4.1R1 |
| | Username/password based SIP phone authentication | V4.1R1 |
| | Auto-installation of SIP phones: Aastra 480i and Speedtouch 2030 | V4.1R1 |
| | Keypad-based telephone installation | V4.1R1 |
| **Voice Features** | Profile to restrict access to some services<br>DND<br>Redial last called, last calling, or missed call<br>CFU<br>Daily CFU<br>Weekly CFU<br>CFB<br>CFNR<br>CFDI<br>Allow/disable multiple call forwards<br>Choose voice mail in case of multiple call forwards (first / last called)<br>Follow-me<br>Boss / secretary filtering: forbid call forward, vocal announcements at off-hook<br>Call waiting / Disable call waiting<br>Internal voice mail<br>MWI for internal voice mail<br>Ability to call back the one who left a voice mail<br>Customizable IVR<br>Music on hold<br>Vocal CLIP<br>CCBS<br>Call pickup<br>Personal ringback message<br>Hunt group: cyclic, simultaneous, cyclic with differentiated priority levels<br>Directory service (speed dial)<br>Locking outgoing calls<br>Login : shared, permanent, one-call<br>Restricting outgoing calls for defined patterns<br>CNIP<br>CLIP<br>CLIR<br>Default-routing (route to pre-defined number if the called party is unknown)<br>General ringing | V4.1R1 |

| | | |
|---|---|---|
| | Management of dual-phones & external voice mail support<br>Name presentation on FXS<br>FXS second call + transfer (FXS user can have two calls on-hold + 1 active)<br>Retrieving a forwarded call<br>Internal voice mail can be configured as simple answering machine<br>Ability to load a sound file for ringback or music on hold<br>Call pickup only in the configured hunt group<br>Ringback configurable per user or per trunk<br>Login as wired phone / permanent login<br>External calls can be forbidden<br>Installation profiles and default installation profile<br>Customisable language per user<br>Presence monitoring of other users<br>Monitoring of CFU destined to an user<br>Time limit for tromboned communications<br>New attributes per number: role, contact, email, firstname<br>Use of <firstname>.<name> as web login | V4.1R2 |
| | Alternate external identity to be presented when calling on the network<br>Keypad to join callee's voicemail directly<br>Scheduled call forward to voicemail | V4.1R5E4 |
| **Phone functions** | FXS:<br>- CLIP<br>- Attended call transfer<br>- 3-way conference<br>- Hold<br>- 2nd call<br>- Brokering<br>- Call Waiting<br>- MWI | V4.1R1 |
| | ISDN Phone:<br>- CLIP, CNIP, CLIR<br>- Attended call transfer (ECT)<br>- 3-way conference (3PTY)<br>- Hold / Retrieve / Brokering<br>- MWI<br>- ISDN call forwards (CFU, CFB, CFNR) | V4.1R1 |
| | SIP phone:<br>- CLIP, CNIP, CLIR<br>- Attended call transfer (REFER method)<br>- 3-way conference (managed by SIP phone)<br>- Hold / Retrieve / Brokering<br>- MWI<br>- Phone based call forwards (302 response) | V4.1R1 |
| **Miscellaneous** | CLI command to dial (basis for the click-to-dial function) | V4.1R1 |
| | Journalized call logs | V4.1R1 |
| | SNTP Relay for phones | V4.1R5E4 |
| | TFTP Relay for phones software upgrade | V4.1R5E4 |
| | Multi information space to store user info. | V4.1R5E4 |
| | Save and restore functions for system backup | V4.1R5E4 |
| | SMTP Authentification for voice-to-email | V4.1R5E5 |
| | DHCP Vendor ID phone recognition for auto provisioning | V4.1R5E5 |
| | Directory provisioning for Aastra and Thomson phones | V4.1R5E6 |
| | IBC RTP port range customization | V4.1R5E6 |
| | CSTA interface for click'n'dial TAPI application | V4.2R3 |
| | Wifi to GSM handover | V4.2R4 |
| | Busy Lamp Function (BLF) | V4.2R4 |
| | Simultaneous ringing | V4.2R4 |

| | | |
|---|---|---|
| | Number presentation customization | V4.2R4 |
| | Wav files loading | V4.2R4 |

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## 2.1 USER'S GUIDE WITH PHONE KEYPAD

This chapter deals with voice feature description and activation codes.

### 2.1.1 Conventions

| Actions / Events on Phone | Meaning |
|---|---|
| | The user picks up the phone. |
| | The user presses some keys on its phone keypad. |
| | The user hangs up the phone |
| | The user dials a sequence of digits. The sequence can correspond to a code or a phone number. |
| | Hook flash (analog phones only) |
| | Telephone call is in progress. |

***Warning***

With traditional phones, the user must 1) pick up the phone 2) dial the phone number 3) wait for connection. With IP phones, the user may have to press an extra button to start the call after dialling the phone number.

### 2.1.2 Essential Keypad Codes for Most Common Services

| Service | Keypad Sequence |
|---|---|
| **Redial last Missed call** | |
| **Unconditional Call Forward** | ← Forward-to phone number |
| **Canceling all Call Forwards** | |
| **Speed Dial** | ← Short code |
| **Interrogating and Configuring Voice Mail** | |

### 2.1.3 Essential Keypad for Boss / Assistant Filtering

***Keypad for Manager(s):***

| Service | Keypad Sequence |
|---|---|
| **Forward all calls to secretary** | * 2 8 * ← Secretary number |
| **Forward calls to secretary only if unavailable or busy or not responding** | * 2 7 * ← Secretary number |
| **Canceling all Call Forwards** | * 2 0 |

***Keypad for Secretary:***

| Service | Keypad Sequence |
|---|---|
| **Activating announcement of manager availability** (when a call destined to the manager is forwarded to the secretary, an announcement telling manager status –busy, unavailable, …- is told to the secretary) | * 3 3 * 4 |
| **Activating announcement of which manager has forwarded the call** (in the event a secretary has got several managers, an announcement of forwarding manager is told to the secretary) | * 3 3 * 3 |
| **Activating all possible Forwarding announcements** (the announcement tells which manager forwarded the call, the manager status and the caller number) | * 3 3 * 5 |
| **De-activating all announcements** | * 3 3 * 0 |
| **Rejecting forwarded calls** (if the secretary is away from office, he/she may disable call forwarding from manager, so that the manager receives the calls) | * 8 9 * 1 |
| **Accepting again call forwards** (when the secretary is back to office) | * 8 9 * 0 |

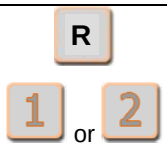
### 2.1.4 Advanced Services With Analog Phones

The services described in this section are only relevant for FXS phones attached to an IBC router.

#### *2.1.4.1 Call Waiting*

When an FXS subscriber has got one call a progress and a second call destined to that subscriber comes in, the FXS subscriber hears a call waiting tone and the caller hears the phone ringing. The FXS subscriber may decide to put the active call on-hold (therefore the remote party placed on-hold hears the music-on-hold).

***Call Waiting: Putting Active Call on-Hold and Accepting Second Call***

| Actions / Events on Phone | Comments |
|---|---|
| | One call is active |
| "Beep" | The call waiting tone is played |
|  | Press hook flash button followed by 1 or 2. |
| | You are connected with second caller. |

### *2.1.4.2 Second Call*

When a call is active, it is possible to put this call on hold, and then to call a second subscriber.

***Making a Second Call***

| Actions / Events on Phone | Comments |
|---|---|
| | One call is active |
| | Press hook flash button. |
| | A dialing tone is played. Dial the phone number of another subscriber. |
| | IBC attempts to connect the call with the new subscriber. |

### *2.1.4.3 Releasing Second Call*

When a call is active and one on-hold, you can release the currently active call and switch to the other one.

***Releasing Second Call***

| Actions / Events on Phone | Comments |
|---|---|
| | One call is active, one is on-hold |
| | Press hook flash button followed by 1. |
| | You are now connected with the remote party that was on-hold. The remote that was previously active is now disconnected. |

### *2.1.4.4 Brokering*

Brokering is feature related to an FXS subscriber having two SIP call legs. It refers to the action of switching between calls, i.e. putting one call on-hold and retrieving the other call (that was on-hold). The party on-hold hears the music-on-hold.

***Brokering***

| Actions / Events on Phone | Comments |
|---|---|
| | Two calls are connected (one active, one on-hold. |
| | Press hook flash button followed by 2. |
| | You are now in communication with the party previously on-hold. The formerly active party is now on-hold. |

### *2.1.4.5 Attended Call Transfer*

Attended call transfer is also called call transfer with consultation.

A is an FXS subscriber. A is in conversation with B. A puts B on hold. A calls C. A asks C if he wants to talk to B. Then, A initiates a call Transfer, so that B talks to C and calls from A to B or C are released.

***Attended Call Transfer***

| Actions / Events on Phone | Comments |
|---|---|
| | One call is active |
| | Press hook flash button. |
| | A dialing tone is played. Dial the phone number of another subscriber. |
| | The new subscriber picks up the phone. |
| | Then, Hook-on, the call is transferred.<br>**Note: depending of the IBC setting, the transfer can also be done with R4 instead of on-hook.** |

### *2.1.4.6 Three-Way Conference*

When a FXS subscriber has got two calls (one active, one on-hold) the FXS subscriber may decide to start a three-way conference. Three-way conference is started by pressing hook-flash and 3.

***Making a Second Call and Starting 3-Way Conference***

| Actions / Events on Phone | Comments |
|---|---|
| | One call is active |
| | Press hook flash button. |
| | A dialing tone is played. Dial the phone number of another subscriber. |
| | IBC attempts to connect the call with the new subscriber. The other subscriber's phone rings. |
| | The new subscriber answers. |
| | Press hook-flash, then 3. |

| | |
|---|---|
| | 3-way conference is started. |

### 2.1.5 Advanced Services With ISDN / SIP Phones

The same services can be offered on ISDN or SIP phones as those offered with FXS phones, as mentioned in the preceding section. Please consult the user manual of your ISDN or SIP phones for more details.

### 2.1.6 Dialing Features

#### *2.1.6.1 Re-dial Last Calling Number*

This feature enables a user to recall the last caller if the call was answered. If the call was not answered, the call is considered a missed call. In that latter case, please refer to: 2.1.6.4.

***Redialing Last Calling Number***

| Actions / Events on Phone | Comments |
|---|---|
| | Off-hook the phone |
| | Dial *53. IBC spells the phone number of last calling number, then the extension is dialed. |

***Flushing Last Calling Number Information***

| Actions / Events on Phone | Comments |
|---|---|
| | Off-hook the phone |
| | Dial *53*0. IBC erases saved information about last calling number. |

***Interrogating Last Calling Number***

| Actions / Events on Phone | Comments |
|---|---|
| | Off-hook the phone |
| | Dial **53. IBC spells the phone number of last calling number. |

#### *2.1.6.2 Re-dial Last Called Number*

This feature enables an user to recall the last called phone number.

***Redialing Last Called***

| Actions / Events on Phone | Comments |
|---|---|
| | Off-hook the phone |
| | Dial *54. Thelast called number is dialed. |

***Flushing Last Called Information***

| Actions / Events on Phone | Comments |
|---|---|
| | Off-hook the phone |
| | Dial *54*0. IBC spells the number and erases saved information about last called number. |

***Interrogating Last Called Number***

| Actions / Events on Phone | Comments |
|---|---|
| | Off-hook the phone |
| | Dial **54. IBC spells the phone number of last called number. |

### *2.1.6.3 Re-dial for Last Caller or Called*

The next keypad redials the phone number of the last answered call (incoming or outgoing call). In other words, this service is the combination of redial service for last called/calling number.

***Redialing Caller of Last Missed Call***

| Actions / Events on Phone | Comments |
|---|---|
| | Off-hook the phone |
| | Dial *52. The last missed called numberis dialed. |

### *2.1.6.4 Re-dial for Missed Calls*

A missed call is an incoming call that was not answered. The following keypads allow the user to recall the caller of the last missed call.

***Redialing Caller of Last Missed Call***

| Actions / Events on Phone | Comments |
|---|---|
| | Off-hook the phone |
| | Dial *51. The last missed called number is dialed. |

***Flushing Last Missed Called Information***

| Actions / Events on Phone | Comments |
|---|---|
| | Off-hook the phone |
| | Dial *51*0. IBC spells the number and erases saved information about last missed called number. |

| | |
|---|---|
| | |

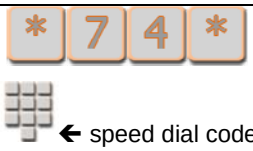
***Interrogating Last Called Number***

| Actions / Events on Phone | Comments |
|---|---|
| | Off-hook the phone |
| | Dial **51. IBC spells the phone number of last missed called number. |

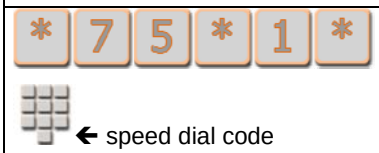
### *2.1.6.5 Speed Dial (Directory service)*

The directory service makes it possible to dial a full phone number with short dialing code. This feature is also known as directory service.

***Making a Speed Dial***

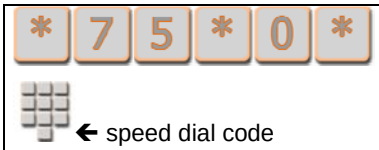
| Actions / Events on Phone | Comments |
|---|---|
| | Off-hook the phone |
|  ← speed dial code | Dial *74* and the short number. For example: *74*00. The call is initiated. |

***Adding a Number in Personal Directory***

| Actions / Events on Phone | Comments |
|---|---|
| | Off-hook the phone |
|  ← speed dial code<br> <br> ← full phone number | Dial (*75*1* + short number + * + full number). |
| | Hook on. The number is saved. |

***Deleting a Number in Personal Directory***

| Actions / Events on Phone | Comments |
|---|---|
| | Off-hook the phone |

| | |
|---|---|
|  <br>← speed dial code | Dial *75*0*, then the short number.<br>For example: dialing *75*0*11 deletes the number whose short number is 11. |

***Interrogating a Number in Personal Directory***

| Actions / Events on Phone | Comments |
|---|---|
| | Off-hook the phone |
| <br>← speed dial code | Dial **75*, then the short number followed by * and speed dial code.<br>For example: dialing **75*12 tells the full phone number whose short code is 12. |

If the user phone is auto-provisioned and has the proper faculty, the directory will be provided directory on the phone interface. This feature is available on the following phones:

- Thomson ST2030
- Thomson ST2022
- Aastra 53i
- Aastra 55i
- Aastra 57i

### 2.1.7 Number Screening and Privacy

#### *2.1.7.1 Hiding Calling Phone Number*

The CLIR (Calling Line Identity Restriction) activation allows an user to tell the telephone network that his caller-id must not be displayed.

***Activating CLIR***

| Actions / Events on Phone | Comments |
|---|---|
| | Off-hook the phone |
| | Dial *65*1 and the caller-id is now hidden for any new call. |
| | Hang up |

***De-Activating CLIR***

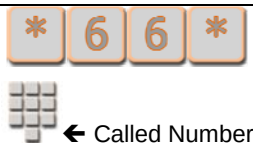
| Actions / Events on Phone | Comments |
|---|---|

| | |
|---|---|
| | Off-hook the phone |
| | Dial *65*0 and the caller-id is now hidden for any new call. |
| | Hang up |

***Interrogating CLIR Status***

| Actions / Events on Phone | Comments |
|---|---|
| | Off-hook the phone |
| | Dial **65 and IBC tells what is the current CLIR activation status. |

***Enabling CLIR Temporarily***

| Actions / Events on Phone | Comments |
|---|---|
| | Off-hook the phone |
|  ← Called Number | Dial *66* + <called number> and IBC dials called number with CLIR active only for that call. |

### *2.1.7.2 Vocal Caller-Identity Presentation (CLIP)*

The Vocal CLIP feature instructs IBC to tell the caller phone number in case of incoming call. Let us say that A calls B. B has enabled Vocal CLIP. B's phone rings. B hooks off; IBC spells the A phone number. This feature is useful for phones without display or for blind people.

***Activating Vocal CLIP***

| **Actions / Events on Phone** | **Comments** |
|---|---|
| | Off-hook the phone |
| | Dial *33*1 and the Vocal CLIP service is active. |
| | Hang up |

***De-Activating Vocal CLIP***

| **Actions / Events on Phone** | **Comments** |
|---|---|
| | Off-hook the phone |

| | |
|---|---|
| | Dial *33*0 and Vocal CLIP is de-activated. |
| | Hang up |

***Interrogating Vocal CLIP Status***

| **Actions / Events on Phone** | **Comments** |
|---|---|
| | Off-hook the phone |
| | Dial **33 and IBC tells what is the current vocal CLIP activation status. |
| | Hang up |

### *2.1.7.3 Do Not Disturb (DND)*

When the DND feature is active on a specific extension, it means that the called party does not wish to receive a call:

- If the user is called, the called party in DND mode is considered busy
- If the phone is part of a hunt group, it is set temporarily out of the group.

***Activating DND***

| **Actions / Events on Phone** | **Comments** |
|---|---|
| | Off-hook the phone |
| | Dial *29*1 and the DND service is active. |
| | Hang up |

***De-Activating DND***

| **Actions / Events on Phone** | **Comments** |
|---|---|
| | Off-hook the phone |
| | Dial *29*0 and DND is de-activated. |
| | Hang up |

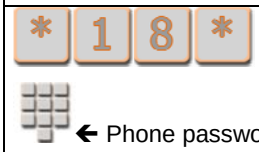
***Interrogating DND Status***

| Actions / Events on Phone | Comments |
|---|---|
| | Off-hook the phone |
| | Dial **29 and IBC tells what is the current DND activation status. |

### *2.1.7.4 Locking a Phone*

It is possible to lock outgoing calls from a phone by entering a lock dial-code containing a series of digits representing a password. To unlock, the password must be re-entered within special dial-code.

***Unlocking the Phone***

| Actions / Events on Phone | Comments |
|---|---|
| | Off-hook the phone |
|  | Dial *18*<password> from the phone and the phone is unlocked. (Default state) |
| | Hang up |

***Locking the Phone***

| Actions / Events on Phone | Comments |
|---|---|
| | Off-hook the phone |
| | Dial *17 from the phone and the phone is locked. |
| | Hang up |

### 2.1.8 Entering / Exiting Hunt Group

A hunt group is a phone number that is not associated with a phone. The hunt group is associated with a set of phones. When the hunt group is called, the phones members of this group are called.

***Entering a Hunt Group***

| Actions / Events on Phone | Comments |
|---|---|
| | Off-hook the phone |
| | Dial *31* + the hunt group phone number and the phone enters the corresponding hunt group. The phone must be part of the hunt group to use |

| | |
|---|---|
| ← hunt group number | this function. |
| | Hang up |

***Exiting a Hunt Group***

| **Actions / Events on Phone** | **Comments** |
|---|---|
| | Off-hook the phone |
| ← hunt group number | Dial *30* + the hunt group phone number and the phone exits the hunt group. You cannot leave the hunt group if the phone is the last remaining member of the group |
| | Hang up |

***Entering all Hunt Groups***

| **Actions / Events on Phone** | **Comments** |
|---|---|
| | Off-hook the phone |
| | Dial *31 and the phone enters all hunt groups. |
| | Hang up |

***Exiting a Hunt Group***

| **Actions / Events on Phone** | **Comments** |
|---|---|
| | Off-hook the phone |
| | Dial *30 and the phone exits all hunt groups. |
| | Hang up |

### 2.1.9 Call Forwarding (CF)

Call Forwarding is a set of telephony services forwarding calls based on several criteria: called user not responding, busy, disconnected …

#### *2.1.9.1 Disabling all Call Forwarding*

As you will see in the next sections, there are several types of call forwarding. To disable all call forwards (except scheduled CFU), you can use the next command.

| **Actions / Events on Phone** | **Comments** |
|---|---|

| | |
|---|---|
| | Off-hook the phone |
| | Dial *20 and all possible call forwards (except scheduled CFU) are disabled. |
| | Hang up |

### *2.1.9.2 Call Forwarding Unconditional (CFU)*

CFU is also called Call Forwarding Always (CFA). When this service is active, any received call is immediately forwarded to another number.

***Activating CFU***

| Actions / Events on Phone | Comments |
|---|---|
| | Off-hook the phone |
| | Dial *28* and the phone number where the call must be forwarded to. |
| | Hang up |

***Re-Activating CFU on the Last Programmed Number***

| Actions / Events on Phone | Comments |
|---|---|
| | Off-hook the phone |
| | Dial *28. The CFU will be activated on the last CFU number. |
| | Hang up |

***De-Activating CFU***

| Actions / Events on Phone | Comments |
|---|---|
| | Off-hook the phone |
| | Dial *28*0 and CFU is de-activated. |
| | Hang up |

***Interrogating CFU Status***

| Actions / Events on Phone | Comments |
|---|---|
| | Off-hook the phone |

| | |
|---|---|
| | Dial **28 and IBC tells what is the current CFU activation status. |
| | Hang up |

### *2.1.9.3 Call Forwarding on Busy (CFB)*

When this service is active on an extension, any received call is forwarded to another number, if the extension has got one call active.

***Activating CFB***

| **Actions / Events on Phone** | **Comments** |
|---|---|
| | Off-hook the phone |
| | Dial *22* and the phone number where the call must be forwarded to. |
| | Hang up. |

***Re-Activating CFB on the Last Programmed Number***

| **Actions / Events on Phone** | **Comments** |
|---|---|
| | Off-hook the phone |
| | Dial *22. The CFB will activated on the last CFB number. |
| | Hang up |

***De-Activating CFB***

| **Actions / Events on Phone** | **Comments** |
|---|---|
| | Off-hook the phone |
| | Dial *22*0 and CFB is de-activated. |
| | Hang up |

***Interrogating CFB Status***

| **Actions / Events on Phone** | **Comments** |
|---|---|

| | |
|---|---|
| | Off-hook the phone |
| | Dial **22 and IBC tells what is the current CFB activation status. |
| | Hang up |

### *2.1.9.4 Call Forwarding on No Reply (CFNR)*

When this service is active on an extension, any received call is forwarded to another number, if the extension did not answer after several rings.

***Activating CFNR***

| **Actions / Events on Phone** | **Comments** |
|---|---|
| | Off-hook the phone |
| | Dial *21* and the phone number where the call must be forwarded to. |
| | Hang up |

***Re-Activating CFNR on the Last Programmed Number***

| **Actions / Events on Phone** | **Comments** |
|---|---|
| | Off-hook the phone |
| | Dial *21. The CFNR will activated on the last CFNR number. |
| | Hang up |

***De-Activating CFNR***

| **Actions / Events on Phone** | **Comments** |
|---|---|
| | Off-hook the phone |
| | Dial *21*0 and CFNR is de-activated. |
| | Hang up |

***Interrogating CFNR Status***

| Actions / Events on Phone | Comments |
|---|---|
| | Off-hook the phone |
| | Dial **21 and IBC tells what is the current CFNR activation status. |
| | Hang up |

### *2.1.9.5 Call Forwarding on Disconnected (CFDI)*

When this service is active on an extension, any received call is forwarded immediately to another number, if the extension cannot be reached. CFDI is particularly useful for wireless SIP phones or dual-mode wireless phones because they can be temporarily unavailable quite often.

***Activating CFDI***

| Actions / Events on Phone | Comments |
|---|---|
| | Off-hook the phone |
| | Dial *24* and the phone number where the call must be forwarded to. |
| | Hang up |

***Re-Activating CFDI on the Last Programmed Number***

| Actions / Events on Phone | Comments |
|---|---|
| | Off-hook the phone |
| | Dial *21. The CFDI will be activated on the last CFDI number. |
| | Hang up |

***De-Activating CFDI***

| Actions / Events on Phone | Comments |
|---|---|
| | Off-hook the phone |
| | Dial *24*0 and CFDI is de-activated. |
| | Hang up. |

***Interrogating CFDI Status***

| Actions / Events on Phone | Comments |
|---|---|
| | Off-hook the phone |
| | Dial **24 and IBC tells what is the current CFDI activation status. |
| | Hang up. |

### *2.1.9.6 Simultaneous CFDI and CFNR Activation*

When this service is active on an extension, any received call is forwarded immediately to another number, if the extension cannot be reached or does not reply.

***Activating CFDI and CFNR***

| Actions / Events on Phone | Comments |
|---|---|
| | Off-hook the phone |
| | Dial *25* and the phone number where the call must be forwarded to. |
| | Hang up |

***Re-Activating CFDI and CFNR on the Last Programmed Number***

| Actions / Events on Phone | Comments |
|---|---|
| | Off-hook the phone |
| | Dial *25. The CFDI+CFNR will be activated on the last CFDI+CFNR number. |
| | Hang up |

***De-Activating CFDI and CFNR***

| Actions / Events on Phone | Comments |
|---|---|
| | Off-hook the phone |
| | Dial *25*0 and CFDI+CFNR is de-activated. |
| | Hang up. |

***Interrogating CFDI and CFNR Status***

| Actions / Events on Phone | Comments |
|---|---|
| | Off-hook the phone |
| | Dial **25 and IBC tells what is the current activation status. |
| | Hang up. |

### *2.1.9.7 Simultaneous CFDI and CFB Activation*

When this service is active on an extension, any received call is forwarded immediately to another number, if the extension cannot be reached or is busy.

***Activating CFDI and CFB***

| Actions / Events on Phone | Comments |
|---|---|
| | Off-hook the phone |
| | Dial *26* and the phone number where the call must be forwarded to. |
| | Hang up |

***Re-Activating CFDI and CFB on the Last Programmed Number***

| Actions / Events on Phone | Comments |
|---|---|
| | Off-hook the phone |
| | Dial *26. The CFDI+CFB will activated on the last CFDI+CFB number. |
| | Hang up |

***De-Activating CFDI and CFB***

| Actions / Events on Phone | Comments |
|---|---|
| | Off-hook the phone |
| | Dial *26*0 and CFDI+CFB is de-activated. |
| | Hang up. |

***Interrogating CFDI and CFB Status***

| Actions / Events on Phone | Comments |
|---|---|
| | Off-hook the phone |
| | Dial **26 and IBC tells what is the current activation status. |
| | Hang up. |

### *2.1.9.8 Simultaneous CFDI, CFNR and CFB Activation*

When this service is active on an extension, any received call is forwarded immediately to another number, if the extension cannot be reached or is busy or does not reply.

***Activating CFDI, CFNR and CFB***

| Actions / Events on Phone | Comments |
|---|---|
| | Off-hook the phone |
| | Dial *27* and the phone number where the call must be forwarded to. |
| | Hang up |

***Re-Activating CFDI, CFNR and CFB on the Last Programmed Number***

| Actions / Events on Phone | Comments |
|---|---|
| | Off-hook the phone |
| | Dial *27. The CFDI, CFNR+CFB will activated on the last CFDI, CFNR+CFB number. |
| | Hang up |

***De-Activating CFDI, CFNR and CFB***

| Actions / Events on Phone | Comments |
|---|---|
| | Off-hook the phone |
| | Dial *27*0 and CFDI, CFNR+CFB is de-activated. |

| | |
|---|---|
| | Hang up. |

***Interrogating CFDI, CFNR and CFB Status***

| **Actions / Events on Phone** | **Comments** |
|---|---|
| | Off-hook the phone |
| | Dial **27 and IBC tells what is the current activation status. |
| | Hang up. |

### *2.1.9.9 Scheduled CFU*

A standard CFU (Call Forward Unconditional) is active permanently until explicitly de-activated. A scheduled CFU is a CFU that becomes active periodically. This function is useful to forward calls when the company is closed. Scheduled CFU is programmed by selecting the day. Day number 1 is Monday, 7 is Sunday. 0 indicates all days.

A special case of CFU can be used to forward incoming calls straight to the user's voicemail. For that type of transfer, the user needs to set the destination number to his keypad-profile "Voicemail" keypad. By default, for users without a set keypad-profile, or for hunting-groups, the keypad-profile 1 will be used.

Priorities and management of conflicts when several types of CFU:

- If the user attempts to configure a daily CFU whose time frame overlaps with the first daily CFU time frame, the system rejects the configuration request.
- Weekly CFU permits to configure four time frames where CFU is active every week. Overlapping time frames are rejected by the system.
- Weekly CFU overrides daily CFU and daily CFU overrides standard CFU.

***Activating Scheduled CFU***

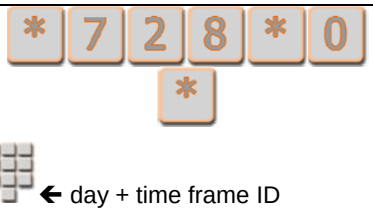
| **Actions / Events on Phone** | **Comments** |
|---|---|
| | Off-hook the phone |
| <br> ← Forward-to number<br> <br> ← Day + time frame ID<br> <br> ← start hour <HHMM> | Dial *728*<number>*<day><time-frame-id>*<hhmm>*<hhmm>*, where:<br>- day is a number from 0 to 7 (0=all, 1=monday…)<br>- time-frame-id is a number from 1 to 4 (up to 4 time-frames per day are allowed)<br>Examples:<br>1) Dialing *728*0141877777*01*1900*2359 and *728*0141877777*01*0000*0900 forwards every day all calls to 0141877777 from 19h00 to 23h59 and from 0h00 to 9h00.<br>2) Dialing *728*0141877777*61*1200*2359 and *728*0141877777*61*0000*0900 forwards every Saturday all calls to 0141877777 from 12h00 to 23h59 and from 0h00 to 9h00.<br>3) Dialing *728*0141877777*71*0000*2359 forwards |

| | |
|---|---|
| ← end hour <HHMM> | every Sunday all calls to 0141877777 from 00h00 to 23h59. |
| | Hang up |

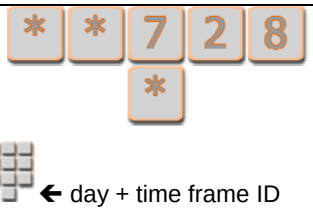
***Re-Activating Scheduled CFU***

| Actions / Events on Phone | Comments |
|---|---|
| | Off-hook the phone |
| ← day + time frame ID | Dial *728*1*<day><time-frame-id> and the previously programmed scheduled CFU is activated again. |
| | Hang up |

***De-Activating Scheduled CFU***

| Actions / Events on Phone | Comments |
|---|---|
| | Off-hook the phone |
|  ← day + time frame ID | Dial *728*0*<day><time-frame-id> and a programmed scheduled CFU is de-activated. |
| | Hang up |

***Querying Scheduled CFU***

| Actions / Events on Phone | Comments |
|---|---|
| | Off-hook the phone |
|  ← day + time frame ID | Dial **728*<day><time-frame-id> and IBC spells the activation status of a programmed scheduled CFU. |

| | |
|---|---|
| | Hang up |

### *2.1.9.10 Enabling/Disabling Multiple Call Forwarding*

Let us say B has forwarded calls to C, C to D … When A calls B, the call is forwarded to C, then D … which is the default behavior. However it is possible to disable multiple call forwards.

***Allowing Multiple Call Forwards***

| **Actions / Events on Phone** | **Comments** |
|---|---|
| | Off-hook the phone |
| | Dial *86*1 and multiple call forwards are allowed. |
| | Hang up |

***Disabling Multiple Call Forwards***

| **Actions / Events on Phone** | **Comments** |
|---|---|
| | Off-hook the phone |
| | Dial *86*0 and multiple call forwards are allowed. |
| | Hang up |

***Querying Multiple Call Forwards Status***

| **Actions / Events on Phone** | **Comments** |
|---|---|
| | Off-hook the phone |
| | Dial **86 and IBC tells multiple call forwards. |

### *2.1.9.11 Follow-Me*

This service (also called 'reach-me' service) is a feature that makes a mobile user more reachable: he may be reachable on his fixed line, but also on his mobile phone or in home office. The follow-me service instructs the IBC to try to reach the subscriber on a first extension (ex.: fixed line), then on 2nd number (his home office), then on a third one (mobile phone).

To setup such service with the interactive voice guide, you must call IBC from your fixed line; then, the IBC asks what first/second/third phone numbers should be used for follow-me service.

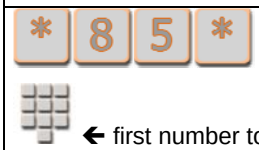
Otherwise, Follow-Me can be setup without voice guide; this second method is quicker to setup, but

requires to dial a more complex pattern.

***Setting Up Follow-Me Service with Interactive Voice Guide***

| Actions / Events on Phone | Comments |
|---|---|
| | Off-hook the phone |
| | Dial *85*2. |
| | The phone is connected with voice guide. IBC asks some questions. Press keys on the phone as appropriate to setup the follow-me service. |

***Setting Up Follow-Me Service with Interactive Voice Guide***

| Actions / Events on Phone | Comments |
|---|---|
| | Off-hook the phone |
|  ← first number to call<br> ← second number to call<br> ← third number to call | Dial *85*<number1>*<number2>*<number3.<br>First, the phone corresponding to called number rings. After a delay, IBC tries to reach <number1>, then <number2> if <number1> does not answer; then <number3>. |
| | Hang up |

***Re-Activating Follow-Me with the Last Programmed Numbers***

| Actions / Events on Phone | Comments |
|---|---|
| | Off-hook the phone |
| | Dial *85 and follow-me is active again. |
| | Hang up |

***Disabling Follow-Me***

| Actions / Events on Phone | Comments |
|---|---|
| | Off-hook the phone |
| | Dial *85*0 and follow-me is de-activated again. |

| | |
|---|---|
| | |
| | Hang up |

### *2.1.9.12 Retrieving a Forwarded Call*

Calls forwarded to a mobile phone can be retrieved on the fixed line for convenience (better speech quality, hands free …).

***Retrieving a Forwarded Call***

| **Actions / Events on Phone** | **Comments** |
|---|---|
| | Off-hook the phone that forwarded the call and where you wish to retrieve the call |
| | Dial *42 |
| | You are now connected with the forwarded call. |

### 2.1.10 Manager / Secretary Filtering

This feature consists in forwarding all calls destined to the manager to the secretary. The manager just needs to configure an unconditional call forward to the secretary. The secretary may transfer the call to the manager. To facilitate secretary's decision to transfer the call, the secretary can program IBC so that it tells the manager status before receiving the forwarded call (example: <x> is busy, unavailable, available, in do-not-disturb mode).

***Secretary Configuring Manager Status Announcement***

| **Actions / Events on Phone** | **Comments** |
|---|---|
| | Off-hook the phone |
| <br>or<br> <br>or<br> <br>or<br> | At off-hook, IBC informs the secretary which phone number is calling (vocal CLIP)<br><br>At off-hook, IBC informs the secretary which phone number is calling and who forwarded the call (phone number or name if available)<br><br>At off-hook, IBC informs the secretary who forwarded the call.<br><br>At off-hook, IBC informs the secretary of the forwarder status (do not disturb, unavailable, available, busy)<br><br>At off-hook, IBC informs the secretary of the forwarder status (do not disturb, unavailable, available, busy), the forwarder number/name and the calling number.<br><br>This code de-activates vocal announcement at off-hook. |

| | |
|---|---|
| or<br> <br>or<br> | |
| | Hang up |

If the secretary is away from office, he/she may disable call forwarding from manager, so that the manager receives the calls. This feature is called call forward rejection.

***Rejecting Call Forwards***

| **Actions / Events on Phone** | **Comments** |
|---|---|
| | Off-hook the phone |
| | Dial *89*1 and forwarded calls (from manager) are rejected. |
| | Hang up |

***Accepting Call Forwards***

| **Actions / Events on Phone** | **Comments** |
|---|---|
| | Off-hook the phone |
| | Dial *89*0 and forwarded calls are accepted (default behavior). |
| | Hang up |

***Querying Call Forward Reject Status***

| **Actions / Events on Phone** | **Comments** |
|---|---|
| | Off-hook the phone |
| | Dial **89 and IBC tells the call forward reject status. |

### 2.1.11 Call Waiting

When a subscriber has got one call in progress and a second call destined to that subscriber comes in, there are two cases:

- Call waiting is disabled: the second call is refused, because the called user is considered busy. The second caller is then forwarded to voice mail or asked for automatic recall.
- Call waiting is enabled: the second caller hears the phone ringing. The called user will hear a call waiting tone (FXS phone) or see a second incoming call on the phone display (ISDN phone, SIP phone)

***Activating Call Waiting***

| Actions / Events on Phone | Comments |
|---|---|
| | Off-hook the phone |
| | Dial *43*1 and call waiting is enabled (default behavior). |
| | Hang up |

***De-activating Call Waiting***

| Actions / Events on Phone | Comments |
|---|---|
| | Off-hook the phone |
| | Dial *43*0 and call waiting is disabled. |
| | Hang up |

***Querying Call Waiting Activation Status***

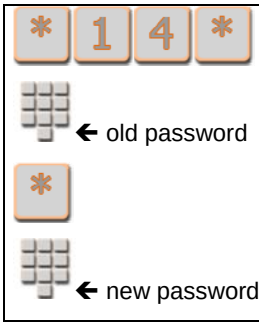
| Actions / Events on Phone | Comments |
|---|---|
| | Off-hook the phone |
| | Dial **43 and IBC tells call waiting activation status. |

### 2.1.12 Voice Mail

To access the voice mail, the default password is the phone main internal number. The password can be changed by dialing a special phone number from user's phone.

***Changing Password***

| Actions / Events on Phone | Comments |
|---|---|
| | Off-hook the phone. |

| | |
|---|---|
|  | Dial *14*<oldpwd>*<newpwd> and listen to instructions to confirm password change. |

***Querying and Configuring Voice Mail***

| **Actions / Events on Phone** | **Comments** |
|---|---|
| | Off-hook the phone |
| | Dial 888 and you are connected with a voice guide to use and configure the voice mail.<br>From the voice menu, you can:<br>- listen to your voice mails<br>- record voice mail greeting<br>- configure your voice mail as a simple answering machine (only a voice message is played, but no voice mail can be recorded). |

In case of call forwards, IBC behavior can be set such that voicemail of the first called or the last called is used. For example: A calls B. B forwarded its calls to C. C is busy. In that case, A must be connected to the voice mail of B (first called) or C (last called).

***Setting Voice Mail of Last User in Case of Call Forwards***

| **Actions / Events on Phone** | **Comments** |
|---|---|
| | Off-hook the phone |
| | Dial *84*1 and voice mail of last called user will be contacted. |
| | Hang up |

***Setting Voice Mail of First User in Case of Call Forwards***

| **Actions / Events on Phone** | **Comments** |
|---|---|
| | Off-hook the phone |
| | Dial *84*0 and voice mail of first called user will be contacted. (default behavior) |
| | Hang up |

***Querying Voice Mail Position***

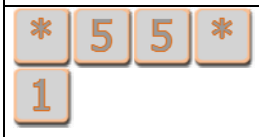
| Actions / Events on Phone | Comments |
|---|---|
| | Off-hook the phone |
| | Dial **84 and IBC tells forward to last voice mail activation status. |

### 2.1.13 Call Completion on Busy Subscriber (CCBS -Automatic Recall-)

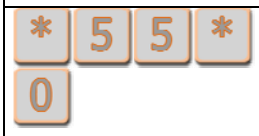
CCBS is a service invoked as an ultimate step before forwarding a call to user voice mail if the called party is busy. Before asking if the calling user wants to leave a message in voice mail box, the caller is prompted to enter a digit to confirm he would like to be recalled. CCBS works when caller and called are internal subscribers.

Let us say A calls B and B is busy. A can activate automatic recall. When B is no longer busy, A is called and A must pick up the phone within 30 seconds. Then, B is called. If A hooks on before B picks up, CCBS is deactivated.

***Enabling CCBS***

| Actions / Events on Phone | Comments |
|---|---|
| | Off-hook the phone. |
|  | Dial *55*1 and automatic recall will be offered when this phone is called while being busy. |
| | Hang up |

***Disabling CCBS***

| Actions / Events on Phone | Comments |
|---|---|
| | Off-hook the phone. |
|  | Dial *55*0 and automatic recall will not be offered when this phone is called while being busy. |
| | Hang up |

***Interrogating CCBS Status***

| Actions / Events on Phone | Comments |
|---|---|
| | Off-hook the phone. |
| | Dial **55 and IBC tells whether CCBS is enabled or not. |

***Deleting Waiting CCBS***

| Actions / Events on Phone | Comments |
|---|---|
| | Off-hook the phone. |
| | Somebody called this phone and requested an automatic recall. Dial *56 and automatic recall is cancelled. |
| | Hang up |

***Asking Waiting CCBS***

| Actions / Events on Phone | Comments |
|---|---|
| | Off-hook the phone. |
| | Dial **56 and IBC tells if an automatic recall is pending. |
| | Hang up |

### 2.1.14 Overflow phone

An overflow phone can be set. This phone is called before cancelling a call when there is no answer and no voicemail or no call forwarding is programmed.

***Setting an overflow phone***

| Actions / Events on Phone | Comments |
|---|---|
| | Off-hook the phone. |
| ← Overflow phone number | Dial *36* and the overflow phone extension. |
| | Hang up |

***Disabling Overflow phone***

| Actions / Events on Phone | Comments |
|---|---|
| | Off-hook the phone. |
| | Dial *36*0 and overflow is de-activated. |
| | Hang up |

***Re-Enabling an overflow phone***

| Actions / Events on Phone | Comments |
|---|---|
| | Off-hook the phone. |
| | Dial *36*1. |
| | Hang up |

***Interrogating Overflow phone status***

| Actions / Events on Phone | Comments |
|---|---|
| | Off-hook the phone. |
| | Dial **36 and IBC overflow activation status. |

### 2.1.15 Ringback Message

Instead of using the standard ring-back tone, a calling external user (internal or external) can hear a sound file (music or vocal announcement). One music file is supported per called phone number.

The ringback message can be recorded by calling a special phone number, which connects to a recording IVR.

***Enabling Ringback Message***

| Actions / Events on Phone | Comments |
|---|---|
| | Off-hook the phone. |
| | Dial *35*1 and the ringback message is active. |
| | Hang up |

***Disabling Ringback Message***

| Actions / Events on Phone | Comments |
|---|---|
| | Off-hook the phone. |
| | Dial *35*0 and the ringback message is de-activated. |
| | Hang up |

***Interrogating Ringback Message***

| Actions / Events on Phone | Comments |
|---|---|
| | Off-hook the phone. |
| | Dial **35 and IBC tells ringback message activation status. |

***Recording Ringback Message***

| Actions / Events on Phone | Comments |
|---|---|
| | Off-hook the phone. |
| | Dial *35*2 and you are connected to a voice guide to record a ringback message. |

### 2.1.16 Call Pickup

Call pickup is a service allowing an authorized user to intercept a call destined to another subscriber. The call-pickup feature functions as follows: A calls B, C hears B's phone ringing. C off-hooks his phone and dials a specific dial pattern. As a result of call pickup feature, A is connected to C (instead of B; B's phone is no more ringing). Call-pickup is enabled by default.

***Picking Up a Call***

| Actions / Events on Phone | Comments |
|---|---|
| | Another phone is ringing. Off-hook the phone. |
| <br> ← ringing phone number to pickup | Dial *44* + the phone number of the ringing phone. If call pickup is authorized on that phone, call is connected. |

***Picking Up a Call from a phone of one of my groups***

| Actions / Events on Phone | Comments |
|---|---|
| | Another phone is ringing. Off-hook the phone. |
| | Dial *44. If call pickup is authorized on that phone, call is connected. |

### 2.1.17 Phone Installation

Phone installation can be automatic or done via the web configuration interface with administrator access, command line interface (CLI) or keypad. Phone installation is a function reserved to administrators. By

default, the administrator password is 0000.

This section deals with phone installation per keypad. In case of FXS, it assumes that the IBC router has a start configuration compatible with this mode (standard OneAccess factory settings). In case of SIP phones, it is assumed that either the SIP phone is recognized by IBC router auto-installation or the SIP phone is already configured such that a call from this SIP phone is possible.

### *2.1.17.1 Adding / Removing Phone Numbers*

#### ***2.1.17.1.1 Adding a Private Phone Number***

The next keypad configures the phone as a phone with an internal phone number only. If the phone number already exists in the system and if it is associated with a SIP phone, the old MAC address associated with this phone is replaced by the new MAC address.

***Phone Installation with Internal Number Only***

| **Actions / Events on Phone** | **Comments** |
|---|---|
| | Off-hook the SIP phone you want to install. |
| ← administrator password ← internal number | Dial **1*<admin-password>*<internal-number> and the number should be installed. |
| | Hang up |

***Phone Installation with Internal Number Only and Using an Installation Profile***

| **Actions / Events on Phone** | **Comments** |
|---|---|
| | Off-hook the SIP phone you want to install. |
| ← installation profile ID (one digit) ← administrator password ← internal number | Dial **1<install-prof-id>*<admin-password>*<internal-number> and the number should be installed with the specified installation profile. |

| | |
|---|---|
| | Hang up |

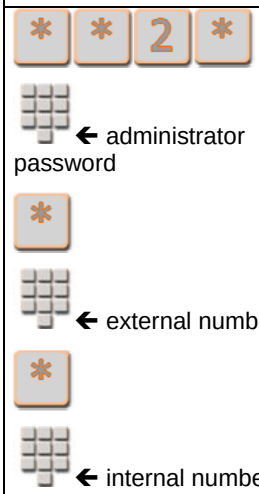
#### *2.1.17.1.2 Assigning a Public Phone Number to a Phone*

Adding a public phone number also adds implicitly a private (internal) phone number; the internal phone number is derived by taking the last three digits. If the phone number already exists in the system and if it is associated with a SIP phone, the old MAC address associated with this phone is replaced by the new MAC address.

***External Number Installation without Entering the Internal Number***

| **Actions / Events on Phone** | **Comments** |
|---|---|
| | Off-hook the phone that you want to install the phone number on. |
| ← administrator password ← external number | Dial **2*<admin-password>*<external-number> and the number should be installed. |
| | Hang up |

***External and Internal Number Installation***

| **Actions / Events on Phone** | **Comments** |
|---|---|
| | Off-hook the phone that you want to install the phone number on. |
|  ← administrator password ← external number ← internal number | Dial **2*<admin-password>*<external-number> *<internal-number> and the number should be installed. |
| | Hang up |

#### *2.1.17.1.3 Uninstalling a Phone Number*

Uninstalling a phone number fails if the phone number is attached to a phone:

***Phone Number Uninstalling from any Phone***

| **Actions / Events on Phone** | **Comments** |
|---|---|
| | Off-hook the phone. |
| ← administrator password ← internal number | Dial **0*<admin-password>*<external-number> and the number should be uninstalled. |
| | Hang up |

***Phone Number Uninstalling from the Phone to be Uninstalled***

| **Actions / Events on Phone** | **Comments** |
|---|---|
| | Off-hook the phone that you want to uninstall. |
| ← administrator password | Dial **0*<admin-password> and the number associated with this phone should be uninstalled. |
|  | Hang up |

### *2.1.17.2 Login*

When some users move around offices, it is possible to reassign a phone number to another phone. In order to do this, the user must enter a special dial-code to log in. Then, any inbound call destined to the user is sent to the phone where the user logged in.

In the "permanent" mode, the older number on the second phone cannot be used any more. The calling number for outbound calls is the new phone number and only the new phone number can be called. Phones to be installed are configured with a default phone number. The permanent login function allows to install the real number on such phones.

In the "wired login" mode, the users logs on a given phone. When a call is destined to that user, both phones ring (as if they were FXS phones on the same wire). If you call from one of these phones, the caller is the logged user. The phone number where the user logged in can still be called.

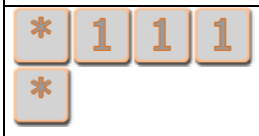
In the "wireless login" mode, the behavior is the same as the wired login. The only difference is: when the phone is disconnected where the login was done, the phone number is considered disconnected. Application:

- Phone A is a fixed line phone number
- Phone B is a mobile
- The user logs phone A number on mobile phone.
- When A is called and the mobile phone is connected, the fixed and mobile line ring
- When A is called and the mobile phone is disconnected, the fixed and mobile line do not ring (call is processed via the Call Forward on Disconnected –CFD-)

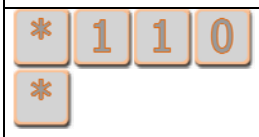
A login on a new phone cancels the older login action on another phone.

It is possible also to do a "one-call login': this mode enables to call from any phone using his phone number as caller-id.

***Permanent Login***

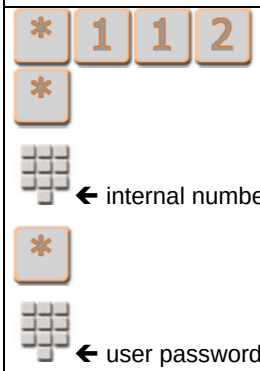
| **Actions / Events on Phone** | **Comments** |
|---|---|
| | Off-hook the phone. |
|  ← internal number ← user password | Dial *111*<internal-number>*<user-password>. The password must correspond to the internal number (not administrator password). |
| | Hang up |

***Logout***

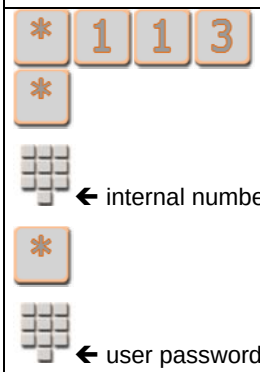
| **Actions / Events on Phone** | **Comments** |
|---|---|
| | Off-hook the phone where you logged on. |
|  ← internal number ← user password | Dial *110*<internal-number>*<user-password>. The password must correspond to the internal number (not administrator password). |
| | Hang up |

***Wired Login***

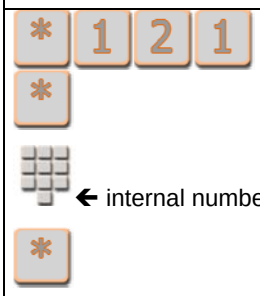
| **Actions / Events on** | **Comments** |
|---|---|

| Phone | |
|---|---|
| | Off-hook the phone. |
|  | Dial *112*<internal-number>*<user-password>. The password must correspond to the internal number (not administrator password). |
| | Hang up |

***Wireless Login***

| Actions / Events on Phone | Comments |
|---|---|
| | Off-hook the phone. |
|  | Dial *113*<internal-number>*<user-password>. The password must correspond to the internal number (not administrator password). |
| | Hang up |

***Shared Line Login***

| Actions / Events on Phone | Comments |
|---|---|
| | Off-hook the phone. |
|  | Dial *121*<internal-number>*<user-password>. The password must correspond to the internal number (not administrator password). |

| | |
|---|---|
| ← user password | |
| | Hang up |

***Shared Line Logout***

| **Actions / Events on Phone** | **Comments** |
|---|---|
| | Off-hook the phone. |
| * 1 2 0 * ← internal number | Dial *120*<internal-number> |
| | Hang up |

***Reset all logins***

| **Actions / Events on Phone** | **Comments** |
|---|---|
| | Off-hook the phone. |
| * 1 0 0 | Dial *100 on your phone, it remove all your login on any phone |
| | Hang up |

***All user logout***

| **Actions / Events on Phone** | **Comments** |
|---|---|
| | Off-hook the phone. |
| * 1 0 | Dial *10 on your phone, it remove all the login on the phone |
| | Hang up |

### *2.1.17.3 Setting Language*

The user can choose his personal language for voice prompts played by IBC (voice mail …). The language is identified by a number: 1 ➔ fr, 2➔en …

***Setting Language***

| Actions / Events on Phone | Comments |
|---|---|
| | Off-hook the personal phone. |
| ← language number (one digit) | Dial **9<language> |
| | Hang up |

***Asking Current Language***

| Actions / Events on Phone | Comments |
|---|---|
| | Off-hook the personal phone. |
| | Dial **9 |

### 2.1.18 Direct Inward System Access (DISA)

DISA is a service that must activated in the system. A public phone number is allocated to DISA service. An external caller can call this public phone number and will be then connected to (or logged in) IBC DISA. The user must then enter its phone number and PIN code. From there, the user can enter any digit sequence as if he was dialing from his internal phone. The user can do the following operations, provided that they are authorized in system configuration:

- Call an internal/external user: the called party will not see the external phone as the caller number. Instead, the called party sees the caller as if it was really calling from its office phone.
- Query voice mail
- Configure or query the status of voice services by entering a keypad

Benefits of DISA:

- The can call the DISA number and get charged for a local call (flat rate service in some countries). Any called number from DISA causes the company to be charged directly for long-distance/abroad/mobile calls.
- You can query voice mail and set up call forwards for example from anywhere.

***Using DISA***

| Actions / Events on Phone | Comments |
|---|---|
| | Off-hook from an **external** phone. |
| | Dial the DISA public phone number. Ask your administrator to get this number. |
| | You are now connected to DISA. A message is played to invite you to dial your private extension number. |
| | Dial your extension number. |

| | |
|---|---|
| | A message is played to invite you to dial your PIN code. |
| | Dial your PIN code. |
| | Dial any digit sequence as if you were calling from your office phone. Example:<br>- 888 to query voice mail<br>- *28*<number> to program an unconditional call forward<br>- 004912345678 to call an external number in Germany for example |

### 2.1.19 Interactive Voice Responder (IVR) Configuration

#### *2.1.19.1 Entering IVR Configuration*

An IVR (Interactive voice responder) turns IBC into a vocal server. For example, when dialing 0141877000, a caller will be connected immediately to the IVR. The IVR plays a message such as: 'Welcome to XYZ company ! Enter 1 for sales department, 2 for technical hotline, 0 for an operator.' If the user presses 2, a voice sub-menu can be played or the call is forwarded to the hotline hunt group (multiple phones may ring). An IVR script can play only one message.

Several IVR can have been declared by CLI or web. The IVR are designated by an ID ranging from one to 10. The exact role of every IVR must be defined externally. For example, a second IVR script could announce the following message 'Welcome to XYZ Company! We are open from 9 a.m. to 19 p.m. from Monday to Friday. Please call us again during open hours'. Call Forward Unconditional can be programmed from one IVR to the other during closed hours.

Up to 2 phone numbers are declared as administration phones. Calling from one of these phones allows changing the content of IVR by following the next steps:

| **Actions / Events on Phone** | **Comments** |
|---|---|
| | Off-hook the phone. |
| <br> ← IVR ID | Dial *37*1 for configuration for IVR 1. Then a voice guide asks some question; press telephone keys and record voice messages as appropriate. |

#### *2.1.19.2 Keypad Commands*

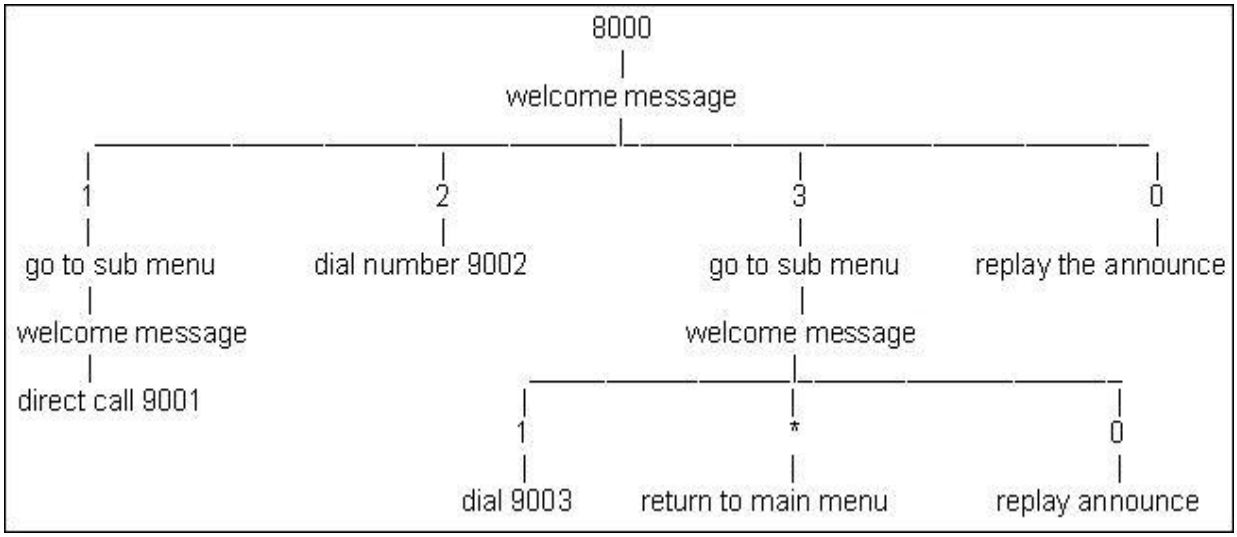
The next command defines the keypad commands for IVR configuration.

| ***Main menu*** | |
|---|---|
| Play the welcome announcement | **1** |
| Record the welcome announcement | **2** |
| Add a direct call after announcement | **3** |
| Delete direct call | **4** |
| Ask for direct call status | **5** |
| Remove IVR | **9** |
| Replay help message | **0** |

| | |
|---|---|
| Associate an action with a key (for example, you can attach the button 1 with the action of going to a sub-menu). Then you are prompted to enter the action defined below. | **6** |
| | |
| ***Configuration menu: key association with an action*** | |
| Associate a call | **1** |
| Associate a return to previous menu | **2** |
| Associate a sub menu | **3** |
| Associate a repetition | **4** |
| Deactivate button | **9** |
| Replay help message | **0** |
| Change button | ***** |
| Return to main menu | **#** |
| | |

### *2.1.19.3 Example*

The example shows how to build a vocal server with 2 levels. Here is the graph of a possible utilization:




First, a phone number is declared as admin phone number of the IVR (receptionist):

```
OneOs# ibc-user-configuration
OneOs(ibc-user-configuration)# receptionist 1
OneOs(receptionist/1)# admin-phone 9000
OneOs(receptionist/1)# exit all
OneOs#
```

***Conventions***: Black text is for actions carried out by the user. Grayed text is for messages played by IBC.

Enter the menu configuration * 37 * 1

Listen to "Configuration menu for voice server number 1. Press one to listen to the message, two to record a message, three to configure an immediate call after the message, four to disable the immediate call, five to know the status of the immediate call, six to associate an action with a button, otherwise press zero to hear this message again."

Press 2 to record your message.

Listen to "Dictate your message after the tone, then press pound."

Record your message and terminate by #

Listen to "Press one to listen to the message, two to record a message, three to configure an immediate call after the message, four to disable the immediate call, five to know the status of the immediate call, six to associate an action with a button, otherwise press zero to hear this message again."

Press 6 to associate an action with a button

Listen to "Please select the button."

Press 0

Listen to "No action is associated with this button. Press one to configure a call number, three to associate a sub-menu, four to repeat the message, nine to deactivate this button, star to configure another button, pound to come back to the main menu, otherwise press zero to hear this message again."

Press 4 to associated a announce repetition

Listen to "Operation successful."

Listen to "Press one to listen to the message, two to record a message, three to configure an immediate call after the message, four to disable the immediate call, five to know the status of the immediate call, six to associate an action with a button, otherwise press zero to hear this message again."

Press 6 to associate an action with a button

Listen to "Please select the button."

Press 1

Listen to "No action is associated with this button. Press one to configure a call number, three to associate a sub-menu, four to repeat the message, nine to deactivate this button, star to configure another button, pound to come back to the main menu, otherwise press zero to hear this message again."

Press 3 to associate a sub menu

Listen to "Operation successful. Press one to listen to the message, two to record a message, three to configure an immediate call after the message, four to disable the immediate call, five to know the status of the immediate call, six to associate an action with a button, otherwise press zero to hear this message again."

Press 6 to access to the new sub menu

Listen to "Please select the button."

Press 1

Listen to "This button provides access to a sub-menu. Press one to go to the sub-menu, two to change the action, three to come back to the main menu, otherwise press zero to hear this message again."

Press 1 to go to the sub menu.

Listen to "Configuration menu for voice server number 1, 1. Press one to listen to the message, two to record a message, three to configure an immediate call after the message, four to disable the immediate call, five to know the status of the immediate call,

six to associate an action with a button, otherwise press zero to hear this message again."

Press 2 to record your message

Listen to "Dictate your message after the tone, then press pound."

Record your message

Listen to "Press one to listen to the message, two to record a message, three to configure an immediate call after the message, four to disable the immediate call, five to know the status of the immediate call, six to associate an action with a button, otherwise press zero to hear this message again."

Press 3 to configure a direct call

Listen to "Please enter the number to call."

Press 9001

Listen to "Operation successful."

Hang-up and redial * 37 * 1

Listen to "Configuration menu for voice server number 1. Press one to listen to the message, two to record a message, three to configure an immediate call after the message, four to disable the immediate call, five to know the status of the immediate call, six to associate an action with a button, otherwise press zero to hear this message again."

Press 6 to associate an action with a button

Listen to "Please select the button."

Press 1

Listen to "No action is associated with this button. Press one to configure a call number, three to associate a sub-menu, four to repeat the message, nine to deactivate this button, star to configure another button, pound to come back to the main menu, otherwise press zero to hear this message again."

Press 1 to configure a call

Listen to "Please enter the number to call."

Press 9002

Listen to "Operation successful."

Listen to "Press one to listen to the message, two to record a message, three to configure an immediate call after the message, four to disable the immediate call, five to know the status of the immediate call, six to associate an action with a button, otherwise press zero to hear this message again."

Press 6 to associate an action with a button

Listen to "Please select the button."

Press 3

Listen to "No action is associated with this button. Press one to configure a call number, three to associate a sub-menu, four to repeat the message, nine to deactivate this button,

star to configure another button, pound to come back to the main menu, otherwise press zero to hear this message again."

Press 3 to associate a sub menu

Listen to "Operation successful. Press one to listen to the message, two to record a message, three to configure an immediate call after the message, four to disable the immediate call, five to know the status of the immediate call, six to associate an action with a button, otherwise press zero to hear this message again."

Press 6 to access to the new sub menu

Listen to "Please select the button."

Press 3

Listen to "This button provides access to a sub-menu. Press one to go to the sub-menu, two to change the action, three to come back to the main menu, otherwise press zero to hear this message again."

Press 1 to go to the sub menu

Listen to "Configuration menu for voice server number 1, 3. Press one to listen to the message, two to record a message, three to configure an immediate call after the message, four to disable the immediate call, five to know the status of the immediate call, six to associate an action with a button, otherwise press zero to hear this message again."

Press 2 to record your message

Listen to "Dictate your message after the tone, then press pound."

Record your message

Listen to "Press one to listen to the message, two to record a message, three to configure an immediate call after the message, four to disable the immediate call, five to know the status of the immediate call, six to associate an action with a button, otherwise press zero to hear this message again."

Press 6 to associate an action with a button

Listen to "Please select the button."

Press 1

Listen to "No action is associated with this button. Press one to associate a transfer, two to associate a return to main menu, three to associate a sub-menu, four to associate a repeat message, nine to deactivate this button, star to configure another button, pound to come back to the main menu, otherwise press zero to hear this message again."

Press 1 to configure a call

Listen to "Please enter the number to call."

Press 9003

Listen to "Operation successful."

Listen to “Press one to listen to the message, two to record a message, three to configure an immediate call after the message, four to disable the immediate call, five to know the status of the immediate call, six to associate an action with a button, otherwise press zero to hear this message again.”

Press 6 to associate an action with a button

Listen to “Please select the button.”

Press *

Listen to “No action is associated with this button. Press one to associate a transfer, two to associate a return to main menu, three to associate a sub-menu, four to associate a repeat message, nine to deactivate this button, star to configure another button, pound to come back to the main menu, otherwise press zero to hear this message again.”

Press 2 to associate a return to the main menu

Listen to “Operation successful."
Listen to “Press one to listen to the message, two to record a message, three to configure an immediate call after the message, four to disable the immediate call, five to know the status of the immediate call, six to associate an action with a button, otherwise press zero to hear this message again.”

Press 6 to associate an action with a button

Listen to “Please select the button.”

Press 0

Listen to “No action is associated with this button. Press one to associate a transfer, two to associate a return to main menu, three to associate a sub-menu, four to associate a repeat message, nine to deactivate this button, star to configure another button, pound to come back to the main menu, otherwise press zero to hear this message again.”

Press 4 to associated a announce repetition

Listen to “Operation successful."

Hang-up and dial 8000 to test your new vocal server

### 2.1.20 Wifi to GSM Handover

#### *2.1.20.1 Objective*

The *Wifi to GSM Handover* function deals with dual-phones (wifi-GSM). When in call on the Wifi interface, a loss of the signal will automatically trigger a new call to the GSM number.

Meanwhile, the other party will be put on hold; and connected automatically once the GSM number is answered.

#### *2.1.20.2 Configuration*

```
OneOs# ibc-user-configuration
OneOs(ibc-user-configuration)# number X
OneOs(number)# handover <enable | disable>
```

By setting the **handover** configuration parameter to **enable**, the function is activated and calls will be triggered.

Remark: the parameter can be set to any type of phones, including non-wifi phones, but will have no effect in that case. As this feature requires a quick polling, activating this feature when not needed would generate unnecessary network traffic.

### 2.1.21 Busy Lamp Field (BLF)

#### *2.1.21.1 Objective*

The objective of BLF is twofold:

- Quick-call function keys on the phones

IP phones connected to the µPBX usually handle several function keys which can be associated with speed-dial numbers. Pressing these keys will automatically call the defined number. This number can be either an internal or external number, and will be dialed as configured.

- Monitoring and call-pickup on configured fellow users

The purpose of this function is built on the previous, but far more advanced. Once associated to a internal phone number, the user will be able to call this number, monitor the activity of that user and intercept calls to that user with a key press.

Three different statuses may be recognized, and may be extended to four, depending on the phone used.

- FREE: The user is either idle, or with a direct call forward activated, or disconnected with a CFD activated. Usually, this status is represented by an OFF LED.
- RINGING: The user is being called. Usually, this status is represented by an BLINKING LED. If the phone key is pressed in that state, the incoming call is intercepted by the monitoring user.
- BUSY: The user is either in call, or unreachable without any call forward, or in Do-not-disturb mode. Usually, this status is represented by an ON LED.
- If the phone can handle four states, then the BUSY state is cut into two states INCALL and UNREACHABLE.

#### *2.1.21.2 Configuration*

```
OneOs# ibc-user-configuration
OneOs(ibc-user-configuration)# number X
OneOs(number)# phone-configuration
OneOs(phone-conf)# [no] phone-key <index> <quick-calls | busy-lamp-field>
<targeted-number>
```

With:

| | |
|---|---|
| **index:** | phone key to be configured. |
| **quick-calls\|busy-lamp-field:** | the type of service desired. |
| **targeted-number:** | phone number to be associated to the phone-key |

### 2.1.22 Displayed number format

*NB: throughout this chapter, the examples used will refer to "33" as a country code, "0" as national code, "00" as international code.*

#### *2.1.22.1 Objective*

The displayed number format function is used to manage per-user the format of numbers, between the national format (e.g. 01…) International format (e.g. 00331…), plus format (e.g. +331….).

The administrator defines the three prefixes that will be used for the whole PBX :

- International prefix: to refer to an international call
- Country prefix: to refer to the country within an international number
- National prefix: to be used within the country

Each user afterwards can define the format of his incoming calls numbers:

- International numbers can be either displayed with "+" followed by the country code, or with the international prefix followed by the country code
- National numbers can be either displayed with "+" followed by the country code, or with the national prefix.

Each trunk can be configured by the administrator to send:

- International numbers either with "+" followed by the country code, or with the international prefix followed by the country code
- National numbers either with "+" followed by the country code, or with the national prefix.

#### *2.1.22.2 Configuration*

Please refert to Adminstration guide for the configuration of the prefixes and the trunk.

Regarding the user configuration of the displayed number format:

```
OneOs# ibc-user-configuration
OneOs(ibc-user-configuration)# number X
OneOs(number)# international-number-display-format <international|plus>
OneOs(number)# national-number-display-format <national|plus>
```

With:

**international** referring to: international-prefix // country-code // national-subscriber-number

**national** referring to: national-code // national-subscriber-number
**plus** referring to: + // country-code // national-subscriber-number

### 2.1.23 Simultaneous ringing

#### *2.1.23.1 Objective*

The Simultaneous ringing function is used to ring another phone on each incoming call, in addition to the normal phone. It is similar to the **force-ringing** function on a trunk configuration (c.f. Administration guide, external trunk configuration for this feature).

#### *2.1.23.2 Configuration*

```
OneOs# ibc-user-configuration
OneOs(ibc-user-configuration)# number X
OneOs(number)# login-simultaneous-ring <number>
```

With number of the phone you wish to ring in addition to your actual phone. This number may be any number (internal/external).

### 2.1.24 Wav file load

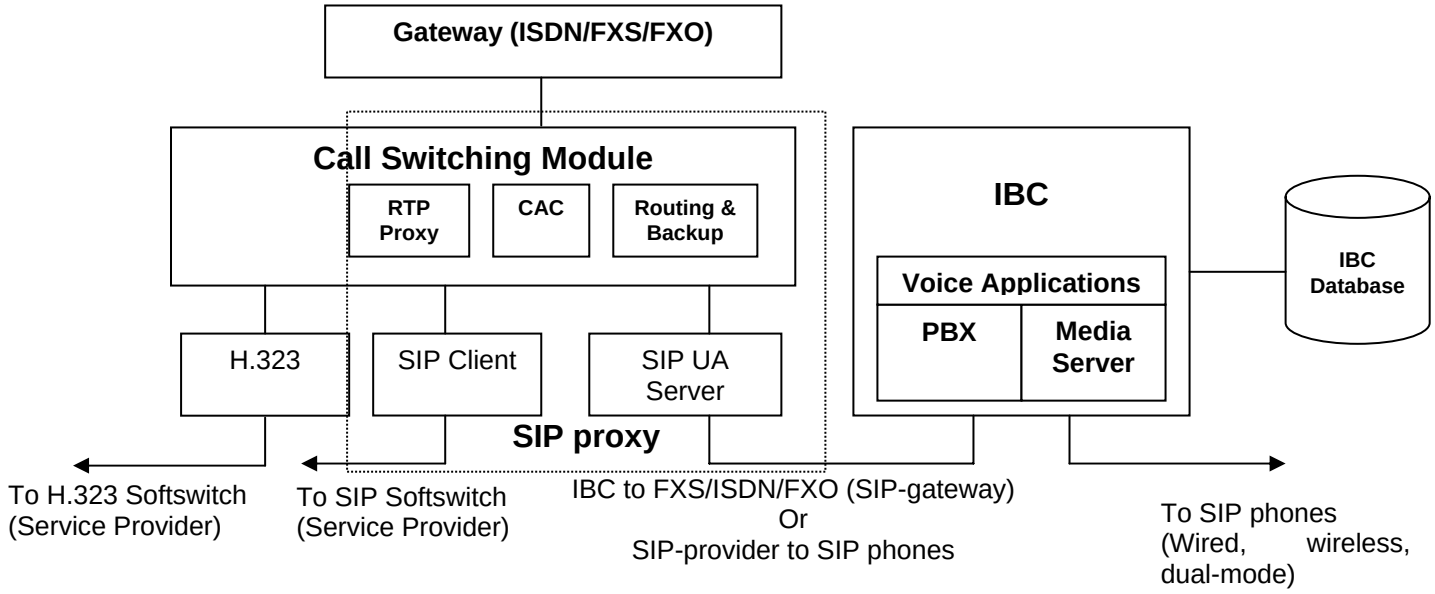
This function allows both users and administrators to upload wav files into the µPBX. This is fully handled by the web interface.

# 2.2 ADMINISTROR'S GUIDE

### 2.2.1 Introduction

#### *2.2.1.1 Global Architecture*

The IBC module is a SIP application server communicating with other devices via SIP (internal or external). The devices can be internal (SIP proxy) or external (SIP phones). The IBC manages a consistent set of voice features for any subscriber type as they are all reached through the SIP protocol. The following diagram summarizes the architecture.




The communication call flows go through the following paths:

- The IBC module can 'talk' to ISDN/FXS/FXO interface via the SIP proxy that forwards SIP signaling to the SIP server, which then switches the call to the internal gateway. The IBC can manage voice features for ISDN and FXS subscriber.
- Incoming SIP calls coming from a softswitch are always switched by the SIP proxy towards the IBC. As depicted on the diagram, the SIP proxy is a subset of the Call Switching Module (CSM). The IBC manages the SIP call and forwards the call to the appropriate subscriber (SIP phone or not).
- Sip phone to SIP phone is managed by the IBC directly.
- SIP phone to ISDN/FXS phone: is switched by IBC then to SIP server finally to the gateway
- SIP phone to external number: the call must go through the service provider infrastructure. The SIP call is managed by the IBC that routes SIP signaling to the Call Switching Module (CSM). Finally the CSM routes the call to the SIP or H.323 softswitch.
- External number to external number: an incoming call can be received, but IBC may carry out a call transfer on another phone number. As external phone number are reached via entities designated as 'external-trunks', this case is called trunk-to-trunk connection. A trunk can be a VoIP provider or ISDN/FXO connected to public legacy PSTN network.

N.B.: **SIP Provider interface is not supported at the present time.**

Some additional details are provided in next section.

On top of routing signaling between IBC and the SIP gateway, the Call Switching Function (CSM) has the following roles:

- Translation of signaling in a compatible SIP format with softswitch
- RTP Proxy (SIP signaling is sent with public IP address of the router instead of the private IBC address; SDP part is translated and NAT ports are controlled in RTP proxy)
- Call admission control: calls might be rejected if too many calls are active on the DSL uplink, in order to avoid congestion.

#### *2.2.1.2 RTP Path*

The IBC does not sit on the RTP path: the RTP stream flows directly between Sip termination points. In case of a call between two SIP phones (same LAN), RTP goes directly from one phone to another. For a call between two legacy phones, the RTP stream is looped internally in the SIP gateway. For Sip phone with internal gateway, the RTP flow goes from the phone to the internal gateway. In case of SIP phone call to a SIP/H.323 provider subscriber, the RTP stream goes through RTP proxy.

#### *2.2.1.3 Configuring SIP Phones*

The IBC module is attached to an IP interface such fastEthernet 0/0. You must configure the following parameter values on your IP phone:

- Registrar IP address = IP address of IBC interface (such as the IP of fastEthernet 0/0)
- Outbound proxy = not configured
- SIP server (can be called also SIP proxy on your SIP phone): same as registrar IP.
- Phone number (display name is optional)
- Authentication username (same as phone number) and password
- DTMF method: DTMF relay in SIP INFO recommended (not RFC2833)
- Packet length : 20 ms. No silence detection
- Optional: support of hold/retrieve/Call transfer/3-way conference

Some additional parameters may need to be configured on the SIP phone. The parameters mentioned above are the most important ones.

#### *2.2.1.4 Fix-Mobile Convergence (FMC)*

As part of Fix-Mobile Convergence (FMC), some telephony service packages are built to provide one user with a single phone number for its fixed and mobile phones. The solution requires a wireless handset supporting SIP over Wifi and GSM (or 3G). The wireless and fixed phones are managed by IBC through a virtual phone subscriber with a single phone number shared by multiple physical devices.

When the user is in the enterprise premises, the wireless handset can be under wifi coverage. The wireless phone can thereby register with IBC. By means of this registration, IBC is made aware of user presence. When the wireless phone is registered, incoming calls make all phones ring (phones sharing the same fixed-mobile number).

When the wireless phone is not registered, it is assumed that the user is outside the enterprise premises. Therefore incoming calls are forwarded to the GSM (or 3G) number. It is possible to deactivate permanently the call forward (for example, if the user has forgotten his phone at home. When the user has got his wireless phone again, he can reactivate the feature). If the GSM call is not successful (phone not reachable, no reply or busy), the call is forwarded to voice mail.

If a call is in progress on one of the phones sharing the same FMC number, it is possible to switch the call between these phones. For example, the call has been answered on wireless phone and it is possible to switch call on the fixed line to benefit from a better utilization comfort.

### 2.2.2 Installing and Upgrading IBC

### *2.2.2.1 Getting Started*

Before installing IBC, please check the software release notes; they provides guidelines to determine if your hardware and boot versions are compatible.

You need 14 MB of free flash space to load IBC (i.e. you probably need to remove the old OneOS first). To check free space, enter the command 'show device status flash://'.

An IBC deliverable is made up of two files:

- An OneOS image (installed as usual)
- A TAR archive file containing IBC files (sound messages and external configuration files)

To load a TAR archive from FTP, enter such command:

```
CLI# ibc load ftp://<user>:<password>@<host>/path/ibc_t1.tar
```

For exact command syntax, please check next section.

### *2.2.2.2 IBC Database Backup and Restore*

The IBC does not require only a simple configuration file such as bsaStart.cfg. The IBC has got a database where the voice feature activation of every subscriber is maintained, as well as IVR scripts. The database is saved automatically. At the next reboot, the IBC database is reloaded, so that the user do not need to re-configure their follow-me service for example.

IBC also needs a collection of sound files. To simplify backup and restore of an IBC system, the following functions are implemented: compression/de-compression as tar archive of all IBC files, tar file system download from and export to FTP/TFTP server.

In the next commands the syntax of an URL is:

- ftp://<user>:<password>@<host>/<pathname>/<filename> for tar archive with FTP
- or tftp://<host>/<pathname>/<filename> for tar archive with FTP
- or <path>/<local-file> for local tar archive

To extract and load a TAR archive:

```
CLI# ibc load <url>
```

To unload some components (database = user configuration & IVR, system = files in flash):

```
CLI# ibc unload { all | database | system | System-and-sounds |database-
only|language {fr | en | pl} }
```

To save some files on a specified URL:

```
CLI# ibc save { all | database | system | System-and-sounds |database-
only } <url>

Please refer to the annex "Aliases for IBC save/unload" for more
information.
```

### *2.2.2.3 Loading Specific Sound Files*

The next command loads a new music-on-hold file (MOH). This command disables the MOH service while the MOH upgrade is in progress. The max-size in bytes is the size of file that can be downloaded, otherwise file transfer is cancelled. The downloaded file must be in *.tar format ( G.729 codec)

```
CLI# ibc load <url> moh [max-size <size>]
```

The next command loads the ringback message for the n-th trunk (see 2.2.9.1.1 for details). This command disables the ringback service while the upgrade is in progress. The downloaded file must be as well in *.tar format, G.729 codec:

```
CLI# ibc load <url> rbmsg trunk <n> [max-size <size>]
```

### 2.2.3 Global IBC Configuration

#### *2.2.3.1 SIP Proxy and IBC Interfaces*

The IBC service is attached to a IP interface and a specific listening port can be defined for the SIP signaling. These parameters must be specified in the CLI configuration.

A change of the IBC service IP interface (or IP address of the IP interface) or SIP server IP interface requires a shutdown / no shutdown operation of the IBC service.

The IP phones are directly managed by the IBC service: the SIP phones register with IBC (not with SIP proxy) and the SIP signaling from SIP phone is always switched by IBC. Therefore the SIP UA-Server interface of the SIP proxy is internal; for example:

```
sip-server
 interface loopback 1
 no shutdown
exit
```

The IBC communicates with the SIP proxy via the IP address of loopback 1. The IBC must be attached to the IP interface used by the IP phones as registrar and proxy IP:

```
CLI(configure)# ibc-service
CLI(ibc-service)# interface { fastethernet <i>/<j> | bvi <id>}
CLI(ibc-service)# sip-proxy { internal | address <A.B.C.D>[:<port>] }
CLI(ibc-service)# sig-port 5200
CLI(ibc-service)# rtp-port-range 10000 10200
CLI(ibc-service)# no shutdown
CLI(ibc-service)#exit
```

The default sig-port (UDP port for SIP) is 5060. Only the 'sip-proxy internal' command is supported (default: sip-proxy-internal).

The default rtp-port-range is 10000-20000. You can define any rtp-port-range which contains at list 100 ports, between 1024 and 65535.

#### *2.2.3.2 VoIP Dial-Peers*

The SIP proxy needs to route incoming calls to a destination. The destination can be legacy subscriber; in that case, such subscriber is known as a 'dial-peer voice pots'. If the destination is a VoIP entity (internal – IBC/SIP phone- or external –SIP/H.323 provider-), the destination is identified as a 'dial-peer voice voip'.

The VoIP dial-peer for IBC is configured as follows:

```
CLI(configure)# dial-peer voice voip <id>
CLI(dp-voip)# sip-ua ip-static <address of ibc>
CLI(dp-voip)# sig-protocol sip
CLI(dp-voip)# exit
```

Here is an example for the VoIP dial-peer for H.323-provider:

```
CLI(configure)# dial-peer voice voip <id>
CLI(dp-voip)# sig-protocol h323
CLI(dp-voip)# exit
CLI(configure)# h323-gateway
...

CLI(h323-gw)# exit
```

#### *2.2.3.3 External Trunk Configuration*

An external trunk is a network port, where IBC dialogs with phone numbers that are not managed by IBC. An external trunk basically represents a port to the public network. External trunks are:

- a VoIP access to SIP provider

- an ISDN port or group of ports
- a FXO port or group of ports

The port is selected regarding dialing information (dial-prefix). If a backup service must be provided (VoIP with ISDN backup), the configuration is done only in the SIP proxy, not in IBC service.

To start configuring an external trunk, please enter the next commands:

```
CLI(configure)# ibc-service
CLI(ibc)# external-trunk
CLI(ext-trunk)# trunk <1..10>
CLI(ext-trunk-conf)#
```

A name can be set for a trunk :

```
CLI(ext-trunk-conf)# trunk-name <name>
```

A dial-prefix can be configured on a trunk. This designates the phone numbers handled within this trunk. If no dial-prefix is configured, any call coming from an internal phone and with an unknown number will be routed to the trunk. IBC routes calls based on called number. If the called number does not correspond to a phone number managed by IBC (such as SIP phone number), IBC routes the call to external trunks.

```
CLI(ext-trunk-conf)# dial-prefix <number>
```

It is usually necessary to add a prefix to called number for calls from IBC to SIP-provider. Vice-versa, incoming calls from Sip-provider carry this prefix (and the prefix is internally removed in IBC). This prefix is thus necessary for an H.323/SIP trunk. To configure this prefix and the trunk type, enter the following commands (default: no routing-prefix):

```
CLI(ext-trunk-conf)# routing-prefix <pattern>
```

IBC routes outgoing calls to a trunk and the caller number is the external phone number. If the caller does not have an external phone number, IBC can route the call if the default trunk identity is configured. The default identity is a public number that phones without public number must use for outgoing calls:

```
CLI(ext-trunk-conf)# default-identity <nbr>
```

To remove the default-identity number:

```
CLI(ext-trunk-conf)# no default-identity
```

IBC routes an incoming call from a trunk to the extension corresponding to the called number. If the called number is not configured in the system, the default-routing number can be configured. This number can be a receptionist for example. To configure the default-routing number:

```
CLI(ext-trunk-conf)# default-routing <nbr>
```

To remove the default-routing number:

```
CLI(ext-trunk-conf)# no default-routing
```

If the general ringing feature is active, any calls incoming from the trunk will make a special phone ring. This feature can be used for example to make an outdoor bell ring. It is configured with the next command:

```
CLI(ext-trunk-conf)# force-ringing <nbr>
```

To remove the force-ringing feature (by default, the feature is disabled):

```
CLI(ext-trunk-conf)# no force-ringing
```

A trunk-to-trunk connection is an incoming external call forwarded to another external call. Trunk-to-trunk connections should be limited in duration, because it makes possible to create call loops. If trunk-to-trunk: is enabled, trunk-to-trunk call is by default enabled and released after 24 hours:

```
CLI(ext-trunk-conf)# tr-tr-connection {disabled |enabled <hours>}
```

The following command activates a ringback message for any incoming call on tis trunk. By default, it is disabled. For more information on ringback message, please refer to this section 2.2.9.1.1. The command is:

```
CLI(ext-trunk-conf)# ringback-message {enabled | disabled}
```

The following command activates an alternative behavior in the case of a trunk-to-trunk connection. By default, the number displayed as caller on the network is the first caller –external to the PBX. With this option set, the number displayed as caller is the last forwarder from within the PBX –internal to the PBX. The command is:

```
CLI(ext-trunk-conf)# calling-number-restrictive
```

To remove the calling-number-restrictive feature (by default, the feature is disabled):

```
CLI(ext-trunk-conf)# no calling-number-restrictive
```

To complete the configuration:

```
CLI(ext-trunk-conf)# exit
CLI(ext-trunk)# exit
CLI(ibc)# exit
```

### *2.2.3.4 Keypad Profile*

A keypad profile contains the list of feature activation code. The profile index 1 is defined per default. The next CLI command list show how to restore default index 1 settings:

```
configure terminal
ibc-service
 keypad-profile
  index 1
! admin fonctions (keypad cannot be modified)
  install-phone     **1*<password>[*<internal number>]
  uninstall-phone   **0*<password>[*<internal number>]
  conf-phone-ddi    **2*<password>*<external-number>

! login/logout
! remove all login */
  alluser-logout          *10
! Real keypad: *111*<internal number>*<user-password>
  user-login              *111*
  user-logout             *110

! Login as wired phone: it behaves as if both phones were on the
! same wire tap. Both phones ring when the logged phone is called
! Real keypad: *112*<internal number>*<user-password>
  login-as-wiredphone *112*

! Login as dual phone: same as wired phone, but when the phone where
! the login was done is no more registered, the user is considered away.
! Real keypad: *113*<internal number>*<user-password>
  login-as-dualphone  *113*

! Real keypad: *121*<internal number>*<user-password>
  user-rcv-login      *121*
! Real keypad *120*<internal number>
  user-rcv-logout     *120*
! reset login and restore default profile
  reset-login         *100
! Real password: *14*<user-password>*<new-user-password>
  new-password         *14*

  disable-outgoing-call *17
! real password: *18*<user-password>
  enable-outgoing-call  *18*

! Disable all call forwarding
  disable-cf-all          *20

! Call Forwarding On No Reply
   enable-cfnr *21
! Real cfnr keypad *21*<number>
```

```
   set-cfnr        *21*
   disable-cfnr    *21*0
   ask-cfnr        **21

! Call Forwarding On Busy
    enable-cfb *22
! Real cfb keypad *22*<number>
    set-cfb         *22*
    disable-cfb     *22*0
    ask-cfb         **22

! Call Forwarding On No Reply or Busy
    enable-cfnr-cfb *23
! Real cfnr keypad *23*<number>
    set-cfnr-cfb       *23*
    disable-cfnr-cfb   *23*0
    ask-cfnr-cfb       **23

! Call Forwarding On Disconnected
    enable-cfdi *24
! Real cfdi keypad *24*<number>
    set-cfdi         *24*
    disable-cfdi     *24*0
    ask-cfdi         **24

! Call Forwarding On Disconnected or No answer
    enable-cfdi-cfnr *25
! Real keypad *25*<number>
    set-cfdi-cfnr *25*
    disable-cfdi-cfnr         *25*0
    ask-cfdi-cfnr            **25

! Call Forwarding On Disconnected or Busy
    enable-cfdi-cfb *26
! Real keypad *26*<number>
    set-cfdi-cfb             *26*
    disable-cfdi-cfb          *26*0
    ask-cfdi-cfb             **26

! Call Forwarding On Disconnected or No answer or Busy
    enable-cfdi-cfnr-cfb *27
! Real keypad *27*<number>
    set-cfdi-cfnr-cfb        *27*
    disable-cfdi-cfnr-cfb     *27*0
    ask-cfdi-cfnr-cfb        **27


! Call Forwarding Unconditional
    enable-cfu *28
! Real keypad *28*<number>
    set-cfu                 *28*
    disable-cfu              *28*0
    ask-cfu                 **28

! Do Not Disturb
    enable-dnd     *29*1
    disable-dnd    *29*0
    do-not-dnd      **29

! hunting group
    exit-all-group          *30
! Real keypad *30*<internal number of group>
    exit-group              *30*
! Real keypad *31*<internal number of group>
    enter-group             *31*
    enter-all-group         *31

! off-hook announcement
```

```
   disale-vocal-pres                       *33*0
   enable-vocal-pres-caller                *33*1
   enable-vocal-pres-caller-forwarder      *33*2
   enable-vocal-pres-forwarder             *33*3
   enable-vocal-pres-forwarder-state       *33*4
   enable-vocal-pres-all                   *33*5
   ask-vocal-pres                          **33

   enable-screened-forwarding                          *34*1
   disable-screened-forwarding                            *34*0
   ask-screened-forwarding             **34

! ringback message
    enable-ring-back-message               *35*1
    disable-ring-back-message              *35*0
    ask-ring-back-message-state              **35
    record-ring-back-message               *35*2

! receptionist. Real keypad: *37*<receptionist>
    setup-receptionist      *37*

! double Call
    enable-call-waiting         *43*1
    disable-call-waiting      *43*0
    ask-call-waiting-state     **43

! delete all recall number (last caller, last called, waiting ccbs)
   delete-caller-called-ccbs *50
   recall-last-missed-call   *51
   delete-last-missed-call   *51*0
   ask-last-missed-call      **51

   recall-last-caller-called *52

! redial last caller
    recall-last-caller      *53
    delete-last-caller      *53*0
    ask-last-caller          **53

! redial last called
    recall-last-called       *54
    delete-last-called       *54*0
    ask-last-called          **54

! CCBS
    enable-ccbs              *55*1
    disable-ccbs             *55*0
    ask-ccbs **55
    ! delete waiting ccbs
    delete-waiting-ccbs              *56
    ! ask waiting ccbs
    ask-waiting-ccbs                 **56

! CLIR
    ! real keypad *66*<number>
    temp-clir               *66*
    enable-clir             *65*1
    disable-clir            *65*0
    clir-state              **65


! scheduled cfu
! day=1-7 0: all days.    id=1-4 (sched. CFU identifier)
    ! real keypad *728*<number>*<day><id>*<HHMM_BEG>*<HHMM_END>
    activate-scheduled-cfu          *728*
    ! real keypad *728*1*<day><plage>
    activale-last-scheduled-cfu     *728*1*
    ! real keypad *728*0*<day><plage>
```

```
    deactivate-scheduled-cfu        *728*0*
    ! real keypad **728*<day><plage>
    ask-scheduled-cfu                **728*

! voice mail of the first or last user when multiple forwarding
    first-forward-to-voicemail         *84*0
    end-forward-to-voicemail           *84*1
    ask-forward-to-voicemail-state     **84

! follow-me
    ! Prefix for the setup of follow-me (ivr)
    setup-follow-me      *85*2
    ! real keypad *85*<number 1>*<number 2>*<number 3>
    conf-follow-me       *85*
    conf-follow-me-ln    *85
    disable-follow-me    *85*0

! Allow cascading call forwarding
    allow-second-forwarding              *86*1
    deny-second-forwarding               *86*0
    ask- second-forwarding-state         **86


! Reject incoming forwarded calls
    deny-cf              *89*1
    accept-cf            *89*0
    deny-cf-state        **89

! User directory
    ! real keypad *74*<short-number>
    directory-dial    *74*
    ! real keypad *75*<short-number>*<full-number>
    directory-insert  *75*1*
! configure directory with IVR
    directory-insert  *75*2
    ! real keypad *75*<short-number>*0
    directory-delete  *75*
     ! real keypad **75*<short-number>
    directory-ask     **75*

! Change language. Language 1 = fr, Language 2 = en, ...
   set-language *9

   ask-language **9

! retrieve forwarded call
    intercept-call     *42

! voicemail and voice mail configuration
    voicemail              888

  exit
 exit
exit
```

### *2.2.3.5 Voice Routing*

Remark: **the Call Switching Module (CSM)** has the role to carry out voice call routing. If CSM routes a call from SIP to SIP, CSM behaves as a SIP proxy.

Voice Routing refers to routing a call flow through the various OneOS modules and finding the final destination of a call. As all calls must be controlled by IBC, some call flows require SIP signaling to enter CSM two-times (first, from CSM to IBC and secondly from IBC to CSM). In order to discriminate the way-in and the way-out to IBC, the recommended solution is the use of prefix #98 as discriminator. The way this routing is realized is further explained below.

***Remark:*** voice-routing re-uses other OneOS components (especially CSM). The drawback of this approach is: the CLI configuration can be quite complex. The advantage though is an unmatched flexibility. The voice-routing can manage call backup from VOIP network to ISDN. You can also configure some ports no to be managed by IBC (such as FXS ports for fax-machines).

***Definitions:***

- SIP phone: wired or wireless or dual-band SIP phone
- Legacy subscriber: phone subscriber attached to the product using a traditional technology (ISDN, FXS)
- External call: the called number can be reached via SIP provider (i.e. via SIP softswitch)
- Internal call: the call must be established between two subscriber attached to the ONEXX0.

The rules for call routing in CSM are the following:

1. Match any number for incoming call from SIP/H.323 provider. The called number gets #98 as prefix. Route the call to IBC.
2. Match called numbers starting with #98 prefix. Remove the prefix #98 and route the call to SIP/H.323 provider.
3. Optional: match called number with #98 prefix, remove the prefix and route the call to a backup interface (FXO, ISDN S0).
4. For any other called number (from gateway or SIP/H.323 provider), route the call to IBC (except for calls coming from IBC)
5. For any other called number (from IBC), route the call to ISDN/FXS/FXO interfaces
6. In IBC, if the call is external, add the prefix #98. incoming external calls carry the #98 prefix.

Here is a list of voice routing cases and associated processing:

| **Calling** | **Called** | **Call Path** |
|---|---|---|
| SIP phone | SIP Phone | SIP ➔ IBC ➔ SIP |
| SIP Phone | Legacy | SIP ➔ IBC ➔ SIP-server ➔ CSM ➔ gateway |
| Legacy | SIP phone | Gateway ➔ CSM ➔ SIP-server ➔ IBC ➔ SIP phone |
| Legacy | Legacy | gateway ➔ CSM (adds #98 prefix in calling number) ➔ SIP-server ➔ IBC (identifies internal call, removes #98 prefix) ➔ SIP-server ➔ SIP-gateway |
| External | SIP phone | SIP-provider ➔ CSM (adds #98 prefix in calling number) ➔ SIP-server ➔ IBC (removes #98 prefix) ➔ SIP-phone |
| SIP phone | External | SIP-phone ➔ IBC ➔ SIP-server ➔ CSM ➔ SIP provider |
| Legacy | External | gateway ➔ CSM (adds #98 prefix) ➔ SIP-server ➔ IBC ➔SIP-server ➔ CSM (removes #98) ➔ SIP provider |
| External | Legacy | Sip provider ➔ CSM (adds #98 prefix) ➔ SIP-server ➔ IBC (identifies internal call, removes #98 prefix) ➔ SIP-server ➔CSM ➔ gateway |

Warning: ***at the present time, SIP trunks are not fully supported. Therefore the next configuration is purely informational.***

Let us assume dial-peer voip 0 is the SIP provider and dial-peer voip 1 is IBC. The configuration looks as follows:

```
ibc-service
 interface fastEthernet 0/0
 external-trunk
   trunk 1
     ! if the user dials anything starting by 0, that's external call
     dial-prefix 0
     trunk-type sip
```

```
      routing-prefix #98
    exit
  exit
  no shutdown
exit
voice-routing
route 1
! a prefix is added to identify an external call
! (coming from voip provider)
! The route has got the type 'incoming'. In other words, the rule matches
! calls coming from Voip 0 (SIP provider)
  dial-peer voip 0
  prefix .
  prefix-type incoming calling last
  insert-prefix #98 calling
 exit
route 2
! a #98 prefix is required to route to the voip provider
! then, the prefix is removed and the call routed to Sip provider.
  dial-peer voip 0
  prefix #98.
  prefix-type outgoing called last
  suppress-prefix 3 called
 exit
! default route to IBC, except for calls coming from IBC (by default, no
! loop allowed.
 route 3
  dial-peer voip 1
  prefix .
 exit
! ISDN/FXS subscriber must be configured
! and registered with SIP provider. => dial-peer pots <id> ua-sip
 route 5
  dial-peer pots 5 ua-sip
  prefix 0141877XXX length 10
  sip-username 0141877000
  sip-authentication my_sip_regid mypassword
 exit
exit
```

### 2.2.4 Restricting Outgoing Calls

On a per-user basis, it is possible to restrict the phone numbers that the user is allowed to dial. For example, this is designed to prevent employees from calling abroad or toll phone services e.g. weather announcement.

To apply such restriction on an user, one must first define a profile. The profile contains filtering rules . The rules are made up of a dial pattern and an action (permit or deny). The default rule defines the behavior of filtering.

- If the default-rule is 'permit', all deny rules are scanned first. If the called number matches a 'deny' rule, the permit rules are scanned. If the number matches a deny and a permit rule, the default-rule applies, i.e. the call is permitted. If the called number matches only a deny rule, the call is not accepted. If the dialed number does not match deny and permit rule, the call is accepted. Example: one rule is 'deny 01' and one rule is 'permit 0141'. Therefore, 0141877000 is accepted but not 013210101010.
- If the default-rule is 'deny', all permit rules are scanned first. If the called number matches a 'permit' rule, the deny rules are scanned. If the number matches a deny and a permit rule, the default-rule applies, i.e. the call is denied. If the called number matches only a permit rule, the call is accepted. If the called number does not match any deny/permit pattern, the call is rejected. Example: one rule is 'deny 0141' and one rule is 'permit 01'. Therefore, 0141877000 is not accepted but 013210101010 is accepted.

To start configuring a new restriction profile:

```
CLI(configure)# ibc-service
CLI(ibc)# out-call-restriction
CLI(out-call-restrict)# profile <1-10>
```

To set the default behavior (default: default-rule deny):

```
CLI(out-call-restrict)# default-rule { permit | deny }
```

To add a rule:

```
CLI(out-call-restrict)# { permit | deny } <dial-prefix>
```

To remove a rule:

```
CLI(out-call-restrict)# no { permit | deny } <dial-prefix>
```

The dial-prefix is the list of first digits of the called number. Up to 50 rules are supported within a profile.

### 2.2.5 Restricting Voice Features

It is sometimes required not to provide all voice features to an user. For example, voice mail should be disabled for a fax machine. The list of supported services for a phone number is configured within a service profile. Then the service profile is applied onto a phone number.

To start configuring a service profile:

```
CLI(configure)# ibc-service
CLI(ibc)# service-profile
CLI(ibc-serv)# profile <1-10>
CLI(service-prof)#  { deny | permit }  user-login
CLI(service-prof)#  { deny | permit }  phone-login
CLI(service-prof)#  { deny | permit }  cf-all
CLI(service-prof)#  { deny | permit }  group-mgmt
CLI(service-prof)#  { deny | permit }  vocal-pres
CLI(service-prof)#  { deny | permit }  ring-back-message
CLI(service-prof)#  { deny | permit }  pickup
CLI(service-prof)#  { deny | permit }  ccbs
CLI(service-prof)#  { deny | permit }  clip-cnip
CLI(service-prof)#  { deny | permit }  follow-me
CLI(service-prof)#  { deny | permit }  dnd
CLI(service-prof)#  { deny | permit }  cf-extern
CLI(service-prof)#  { deny | permit }  screen-forwarder
! Accept DISA
CLI(service-prof)#  { deny | permit }  disa <disa-profile>
CLI(service-prof)#  { deny | permit }  external-call
CLI(service-prof)#  { deny | permit }  call-waiting
```

### 2.2.6 User Profiles

The user profiles define the default user settings. All users installed by keypad inherit from the profile. Also, user settings can be reset to retrieve the profile parameters. For example: profile 1 represent settings of standard user and profile 2 represent settings for a fax/modem.

To start configuring a user profile:

```
CLI(configure)# ibc-service
CLI(ibc)# install-profile
CLI(ibc-inst-profile)# profile <1..10>
 call-pickup                    - install call-pickup
 call-waiting                   - install service call-waiting
 ccbs                           - set ccbs
 cfb                            - set default cfb
 cfd                            - set default cfd
 cfnr                           - set default Cfnr
 cfu                            - set default cfu
 clir                           - set default CLIR
 dnd                            - set installation dnd
 forward-to-voicemail           - set forward to voicemail
 forwarded-call              - set authorisation to use Forwarded Calls
 hunting-group                  - set default hunting-group
 language                       - set default language
 name                           - set profile name
```

```
out-call-restriction-profile    - set default outgoing call restriction
profile
 ringback-message               - set ringback message
 ringing-timeout                - set ringing timeout
 scheduled-cfu                  - install scheduled cfu
 screened-forwarder             - set screened-forwarder
 second-forwarding              - set second forwarding
 service-keypad                 - set default keypad profile
 service-profile                - set default service profile
 voicemail                      - Enable voicemail
```

Configuration commands:

```
! Keypad profile list
CLI(ibc-conf-inst-profile)# service-keypad <1..5>
! Outgoing call restriction
CLI(ibc-conf-inst-profile)# out-call-restriction-profile <1..10>
! service profile list (features allowed/disabled)
CLI(ibc-conf-inst-profile)# service-profile <1..10>
! default hunt-group
CLI(ibc-conf-inst-profile)# hunting-group <group-id> [<priority>]
! Voicemail default configuration
CLI(ibc-conf-inst-profile)#  {voicemail {internal [max-message <0..99>
[message-duration <3..300 s>] [guaranteed-duration <10..3600 s>] [email-
notify [delete | no-attach]] | external <external number> [voice-mail-id
<number> [pause <1-10 seconds>]] | no voicemail}
```

The default installation profile is:

```
ibc-service
 install-profile
  profile 1
   service-keypad 1
    out-call-restriction-profile 1
    services-profile 1
    hunting-group 1 1
    voicemail internal message 3 message-duration 60
   exit
  exit
```

***Example***: installation profile for fax/modem

```
ibc-service
 services-profile
! a fax modem cannot have forwarded calls to voice mail
! nor call waiting
  profile 2
   deny disa
   deny call-waiting
   deny ccbs
  exit
 exit
 install-profile
  profile 1
   service-keypad 1
    out-call-restriction-profile 1
    services-profile 2
    hunting-group 1 1
    no voicemail
   exit
  exit
exit
```

### 2.2.7 Phone Configuration

### *2.2.7.1 Installation Password*

A phone can be installed without using the CLI or web interface, but simply by means of keypad. To realize that installation, a password is required. The default installation password is 0000. To modify the password, use the next command:

```
CLI(configure)# ibc-service
CLI(ibc)# admin-password <number>
```

### *2.2.7.2 Autoinstallation of SIP phone*

SIP Phone can be installed by keypad or autoinstall in a plug'n play mode. The auto-installed phone gets a free internal phone number between the defined interval of phone numbers reserved for auto installation (between min-ext and max-ext).

```
CLI(configure)# ibc-service
CLI(ibc)# auto-install auto <min-ext> <max-ext> install-profile <n>
```

Or it can be installed by keypad **1 or **2

```
CLI(configure)# ibc-service
CLI(ibc)# auto-install keypad internal <pattern>
```

Pattern is the rule to guess the internal number from a given external number. The pattern must be a number prefix (e.g. 1234) + a wild card (e.g. XXX). Example, if the pattern is 3**XX**, a phone installed with **2*pass*0198741**234** will have 3**34** for internal number.

### *2.2.7.3 Phone Number And Hunt Groups*

The analog & ISDN phones must be configured in the SIP gateway part and the voice-routing.

All the private numbers must be configured:

- phones
- internal services (IVR, etc)
- hunt-groups

Other numbers may be associated to a main private number:

- up to 3 alternate private numbers
- a main external number : used to route the call if it comes from a trunk and used as a calling number for any outgoing call (to a trunk)
- up to 3 alternate external numbers

The maximum number of real users can be set via CLI. 'Real user' means phone numbers that are not internal services (that is to say: hunt groups or receptionists). The number of supported users depends on hardware. The next table shows the supported number of users:

| **Product** | **Default and Maximum Number of Users** |
|---|---|
| ONE100 | 20 |
| ONE180 | 20 |
| ONE300 | 20 |

The maximum number of users can be reduced. The command displays an error if 9 users configured when you enter the command max-users 5. To change the maximum number of users:

```
CLI(configure)# ibc-service
CLI(ibc)# max-users { default | <number> }
```

The system default language is inherited by all newly created users. If the users have set a language where the sound file cannot be found, the system use the default language sound file (default: en):

```
CLI(ibc)# default-language {en | fr | pl}
```

The next command defines the minimum available space in flash so that voice mail accepts to record a voice mail. (Default: 1000):

```
CLI(ibc)# min-disk-space <kbytes>
```

The external (main and external) numbers can be used for Registration to the SIP VoIP provider. To start configuring phone number, enter the following command:

```
CLI(configure)# ibc-service
CLI(ibc)# numbering-plan
CLI(ibc-priv-nbr)# [no] index { <1..100> | 0}
CLI(ibc-number)#
```

The index above defines the numbering plan entry where the main-number is stored. The index is a value from 1 to 100. **If you enter 'index 0', the main-number will be inserted at the next available index**.

The command '**no index <id>**' removes the number from database.

The main-number parameter is the internal phone number (abbreviated dialing), for example 4321. (Mandatory parameter must be unique).

```
CLI(ibc-number)# main-number <1-20 digits>
```

The alternate-number parameter is an abbreviated number. Internal users can call this alternate-number. Up to 3 alternate numbers are possible. (Optional parameter)

```
CLI(ibc-number)# [no] alternate-number <1-20 digits>
```

The main-external parameter is the public phone number, for example 0141874321. (Optional parameter, by default, it is the same as main-number)

```
CLI(ibc-number)# [no] main-external <1-20 digits>
```

The alternate-external parameter is an alternate public number. Up to 3 alternate numbers are possible. (Optional parameter)

```
CLI(ibc-number)# [no] alternate-external <1-20 digits>
```

The alternate-external-identity parameter is an alternate public number for outgoing calls only. Once set, it may be chosen by the user to display this alternate number instead of his one on any outgoing call. This is classically used to show the number of your hunt group and do not present your actual number. Please refer to 2.2.9.2 Services for Outgoing Calls for user's part. (Optional parameter)

**CLI(ibc-number)#** [no] alternate-external-identity **<1-20 digits>**The next parameter defines the SIP display name (optional). Add quotes between the display name string if space characters are necessary. The next parameter defines the first name (optional). If name and first name are configured, the SIP display name is <name>_<firstname>. If name and first name are configured, the user login for web access is "<firstname>.<name>".

```
CLI(ibc-number)# { name <name:1-32 characters> [<first-name:1-32
characters>] | no name}
```

The next command is an optional attribute with an arbitrary value. It can help in qualifying a user with a specific role.

```
CLI(ibc-number)# { role <1-32 characters> | no role}
```

The next command is an optional attribute that represents contact address data. It can help in associating user data with a phone number for the address book. If the contact string contains space, the string must be entered between quotation marks:

```
CLI(ibc-number)# { contact "<1-128 characters>" | no contact}
```

The number-type parameter specifies IBC behavior for the type of phone number:

- 'sip-subscriber' must be used for any LAN-side SIP devices (SIP phone, wireless SIP phone, SIP soft phone). A subscriber can be member of a hunt group. (See 'hunting-group' and 'hunting-mode' commands). Authentication is optional and can be MAC-based or password-based.
- 'internal-service' is for services provided by IBC media server (IVR service, voice mail ...). You must then configure the command 'internal-service' to specify what internal service is attached to that number.

- 'hunt-group' indicates that the phone number is attached to a group of subscribers. Hunt groups are needed for call distribution when a phone number can be reached on multiple lines. For example, a hotline is accessed by a single phone number, but several persons can answer.
- 'Legacy-subscriber' indicates an FXS or ISDN phone

```
CLI(ibc-number)# number-type { sip-subscriber [auth-password <password> | mac-addr <XX:XX:XX:XX:XX:XX>] | legacy-subscriber routing-prefix <n> | internal-service | hunt-group <hunt-group id> }
```

A SIP or legacy subscriber can be member of up to 4 hunt groups. To attach/detach the phone number to a hunt group:

```
CLI(ibc-number)# { hunt-group <hunt-group-id 1-10> [<priority: 1-10>] | no hunt-group <hunt-group-id> }
```

Call distribution within a hunt group can be:

- Simultaneous (default): the call is sent to all the phones at the same time.
- Cyclic: any new call is presented to the next phone belonging to the same group. Therefore, the incoming traffic load (in term of number of calls) is shared between all the phones. There is also a backup in case of no response due to busy state : the call is presented to the next phone. The call is dropped if all the free phones have been called. The next new call will be presented to the same phone
- Priority: any new call is presented first to the highest priority phone and successively until the lowest priority in case of no response or busy state. If several have the same priority, the call distribution is cyclic.

```
CLI(ibc-number)# hunting-mode { simultaneous | cyclic | priority } [<timeout-in-seconds>]
```

***Example***: 6000 is the number of a hunt group. 7001, 7002, 7003 (SIP phones) are set as member of the hunt group.

```
configure terminal
 ibc-service
  numbering-plan
   index 0
    main-number 6000
    number-type hunt-group 1
    hunting-mode simultaneous
   exit
   index 0
    main-number 7001
    hunting-group 1
    number-type sip-subscriber
   exit
   index 0
    main-number 7002
    hunting-group 1
    number-type sip-subscriber
   exit
   index 0
    main-number 7003
    hunting-group 1
    number-type sip-subscriber
   exit
  exit
 exit
exit
```

The <timeout> parameter is the number of seconds to consider the called party not available and the hunting continues with next phone of the hunt group. Default <timeout>: 15 seconds.

If the number-type is of type 'internal-service', the internal-service must be provided. 'receptionist <id>' activates the IVR <id>. Voice-mail is a service to read voicemail from a external phone. Disa is a service to log in IBC from an external phone. Then the system treats further action as if the logged user was calling from an internal phone.

```
CLI(ibc-number)# internal-service receptionist <1-10>
CLI(ibc-number)# internal-service voice-mail
CLI(ibc-number)# internal-service disa
```

The installation profile is set as follows:

```
CLI(ibc-number)# {no install-profile | install-profile <id>}
```

The installation profile is applied when the command is used for the first time. The next command overrides the installation profile settings. To reset to installation profile #2, the following commands must be entered:

```
CLI(ibc-number)# installation-profile 2
CLI(ibc-number)# installation-profile 1
```

The keypad profile is the list of voice feature activation codes (such as 3131 to call back last caller). The default keypad profile is 1. To use another keypad profile, enter the next command:

```
CLI(ibc-number)# service-keypad <1-5>
```

The service profile is the list of voice features enabled for a user. By default, all voice features are allowed (no service-profile attached). To use another keypad profile, enter the next command:

```
CLI(ibc-number)# { service-profile <1-10> | no service-profile }
```

The outgoing call restriction profile contains the list of phone patterns that a user is allowed to dial, enter the next command to assign such profile:

```
CLI(ibc-number)# { out-call-restriction-profile <1-10> | no out-call-
restriction-profile }
```

If voicemail is internal (it means messages are managed by IBC and stored in local flash), voice mail duration can be set. Every user gets a guarantied space to store voice mail. If the user has got already more voice mail that this guarantied space (default: 180 s), recording a new voice mail is permitted if all the following conditions are met:

- The current number of message is lower than the maximum number of message (default: 20)
- The free flash space is greater than the min-disk-space parameter (default: 1MB)

Recording is aborted if the message is longer than the max-message-duration (default: 60 s).

```
CLI(ibc-number)# voicemail { internal [guaranteed-duration <10-3600
seconds>] [message-duration <3-300>] [max-messages <0-99>] [email-
notify]| external <external-number> [voice-mail-id <number> [pause <1-10
seconds>]] }
```

If the voice mail is external and a call must be forwarded to voice mail, calls are forwarded to a phone number. If the option 'voice-mail-id', the main-external number of called user is sent as DTMF. This series of DTMF allows the external voice mail to identify on which mail box to leave a message. The 'pause' argument is the pause between call establishment and the sending of DTMF (default: 3 seconds).

A general field for user information is also available to store any specific user details. This field is only accessible from the web interface provided.

### *2.2.7.4 Computer Supported Telephony Application (CSTA) Server*

OneOS IBC provides a CSTA interface to allow the integration of computer application with telephony features. OneOS supports CSTA messages conforming to CSTA phase 3 in XML format. At present, only a CSTA subset is implemented that allows the '*Open IBC Connector*' program (developed by OneAccess) to click and dial from Microsoft Outlook ™. CSTA messages are encapsulated over TCP and may be optionally authenticated.

CSTA is enabled by default on TCP port 3333. To enable/disable the CSTA server and force the TCP port:

```
CLI(configure)# ibc-service
CLI(ibc-serv)# csta-server [tcp-port <1-65535>]
CLI(ibc-serv)# no csta-server
```

Authentication re-uses the same login/password as the web service (disabled by default). To

enable/disable authentication:

```
CLI(ibc-serv)# [no] csta-server authenticate
```

Keepalive allows detecting dead CSTA peers. The keepalive is disabled by default and is configured with the next command:

```
CLI(ibc-serv)# no csta-server keepalive
CLI(ibc-serv)# csta-server keepalive <seconds>
```

To debug CSTA traces, the following command is recommended:

```
CLI# debug ibc csta
```

To query CSTA server statistics:

```
CLI# show ibc csta
CSTA server is running on TCP port 3333
  8 connections established, 0 connection failures
  2 connections open (limit 10), 1 authentication failures
  keepalive interval 3600 secs
  30 keepalive probes, 0 connections dropped in keepalive
  Client: 192.168.16.6:2082 connected since JUL 09 12:22 2008 [11]
    Last time heard: 00:47:47 ago
    monitored devices: 7080 ref 2172909712
  Client: 192.168.16.61:32839 connected since JUL 08 14:22 2008 [25]
    Last time heard: 00:09:04 ago
```

#### *2.2.7.5 Remotely Rebooting an IP Phone*

A proprietary SIP message makes it possible to reboot a phone remotely. The format of this message is as follows:

```
NOTIFY sip:def@192.168.1.130:2063 SIP/2.0

Via: SIP/2.0/UDP 192.168.1.128:5060

From: <sip:abc@192.168.1.128>

To: <sip:def@192.168.1.130:2063>

Event: check-sync;reboot=true

Date: Tue, 02 Aug 2005 18:25:36 GMT

Call-ID: 123456789@192.168.1.130

CSeq: 1300 NOTIFY

Contact: <sip:abc@192.168.1.128>

Content-Type: application/simple-message-summary

Content-Length: 0
```

Please check first the document of the IP phone vendor to have the confirmation that this message is supported and if that feature is not disabled on your phone.

To reboot the phone, the following CLI commands must be entered:

```
CLI# ibc-user-configuration
CLI(ibc-user-config)# number { <name> | <main-number> }
CLI(ibc-number)# reboot-phone
```

### 2.2.8 Configurable Interactive Voice Response (IVR) Server

From a global prospective, an IVR is a media server that plays some sound files, collects phone user input (DTMF keys) and reacts accordingly by transferring user to other extensions, by playing new sound files

and by activating/de-activating some voice features.

This part focuses on the configurable part of IVR that makes it possible to build an automated receptionist service. For example, when dialing 0141877000, a caller will be connected immediately to the IVR. The IVR plays a message such as: 'Welcome to XYZ Company! Enter 1 for sales department, 2 for technical hotline, 0 for an operator.' If the user presses 2, a voice sub-menu can be played or the call is forwarded to the hotline hunt group (multiple phones may ring). An IVR script can play only one message. For example, a second IVR script could announce the following message 'Welcome to XYZ Company! We are open from 9 a.m. to 19 p.m. from Monday to Friday. Please call us again during open hours.' Call Forward Unconditional can be programmed from one IVR to the other during closed hours.

To start configuring the IVR, enter the next command from global CLI more (not from 'configure terminal'):

```
CLI# ibc-user-configuration
CLI(ibc-user-config)# receptionist <1-10>
CLI(ibc-receptionist)#
```

The next command allows two internal phone numbers to connect IBC and have permission to configure the IVR by phone (such as recording message files). (Optional command)

```
CLI(ibc-receptionist)# admin-phone {<phone1> | <name1>} [{<phone2> | <name2>}]

CLI(ibc-receptionist)# no admin-phone
```

The next command instructs the IVR to playback the sound message. If the dial argument is present, the call is forwarded to the phone number after that the message sound file is fully played.

```
CLI(ibc-receptionist)# message [<filename>] [dial <number>]
```

The 'keypad' basically tells the IVR what to do when the user has pressed a key on his phone by entering in a voice menu. The user can press 0-9, # and *. After entering the keypad command the CLI enters in a sub-menu.

```
CLI(ibc-receptionist)# [no] keypad { <0-9> | # | * }
CLI(keypad-level1)#
```

In a voice sub-menu, the same 'message' command is available. Additionally, an action is possible: either to forward the call to an extension or to go to the voice menu or to wait for another keypad, or to repeat the message.

```
CLI(keypad-level1)# {previous-level |dial <number>|keypad { <0-9> | # | * } | repeat}
```

To display the current receptionist configuration, enter the command:

```
CLI()# display
```

### 2.2.9 IBC Voice Feature Configuration

If your product is configured with all arguments detailed above, your IBC is up and running. You can now activate some voice feature per CLI.

This section deals with voice supplementary services activation/de-activation and configuration. The configuration status of every voice service is kept in an internal database. The following processes (i.e. configuration interface) allow to change service configuration on that database: per CLI, per interactive voice guide or per web interface (not available). This section focuses only on CLI.

All services in this section can be configured by phone. They are saved automatically in IBC database, so that no 'save running-config' is needed.

#### *2.2.9.1 Services for Incoming Calls*

The following services are for users receiving a call. To start configuring such services, go into ibc-number

configuration mode:

```
CLI# ibc-user-configuration
CLI(ibc-user-config)# number { <name> | <main-number> }
```

To display the current configuration for this number, enter the command:

```
CLI(ibc-number)# display
```

#### *2.2.9.1.1 Ringback Message*

Calls coming from a trunk can be connected immediately. A ringback message such as 'Wait, we are trying to reach the called party' is played while IBC is trying to reach the called party. The ringback message can be configured on a per-user basis. In case, the called user configured its own ringback message, the user ringback message is played. By default the feature is disabled:

```
CLI# ibc-user-configuration
CLI(ibc-user-config)# number { <name> | <main-number> }
CLI(ibc-number)# ring-back-message {enabled | disabled}
```

#### *2.2.9.1.2 Selecting a Language*

Every user can configure the language of his choice. This change changes the voice prompts language and potentially the web interface language as well (it depends on web page implementation):

```
CLI# ibc-user-configuration
CLI(ibc-user-config)# number { <name> | <main-number> }
CLI(ibc-number)# language { en | fr | pl |reset}
```

Default: en. 'language reset' sets the default language.

#### *2.2.9.1.3 Setting Up a Dual-Phone*

For more general information about dual-hone principles, please refer to 2.2.1.4.

First, create two numbers associated with a fixed line and a mobile phone. Then, go under the mobile phone user configuration and log on the number of the fixed line. From there, the mobile phone rings simultaneously with the fixed line.

```
CLI# ibc-user-configuration
CLI(ibc-user-config)# number <fixed-phone>
CLI(ibc-number)# login-as-wireless <main-number-fixed-line>
```

You need to configure the CFDI, so that all calls are forwarded to GSM/3G network, when the mobile is not registered (eg.: switched off):

```
CLI# ibc-user-configuration
CLI(ibc-user-config)# number { <name-of-mobile-phone> | <main-number-of-
mobile-phone> }
CLI(ibc-number)# cfd <gsm-number-of-mobile>
```

Example: the internal phone number of a land line is 9000. An internal mobile phone number (over wifi) is 9901 and the external number of the mobile phone is 0612345678. We want this mobile phone to receive calls from fixed line when the mobile is connected via Wifi. Otherwise (on disconnected state), the call is forwarded to the GSM number (0612345678).

```
configure terminal
 ibc-service
  numbering-plan
  index 1
   main-number 9000
   voice-mail external 0608080808 voice-mail-id 0612345678
   name Fixed_Line
  exit
  index 2
```

```
   main-number 9901
   no Voice-mail
   name Mobile
  exit
 exit
exit
ibc-user-config
 number 9000
   cfd 0612345678
   login-as-wireless 9901
 exit
exit
```

#### *2.2.9.1.4 Locking a Phone*

It is possible to lock outgoing calls from a phone by entering a keypad. To unlock, a password must be entered within keypad.

```
CLI# ibc-user-configuration
CLI(ibc-user-config)# number { <name> | <main-number> }
CLI(ibc-number)# outgoing-call { <enabled> | <disabled> }
```

By default, the status is unlocked.

#### *2.2.9.1.5 Vocal Announcements (for Manager/Assistant Filtering)*

In case of manager/assistant filtering, the manager forwards his call to his assistant. For efficiency, the assistant could be willing to be informed before calling the manager about:

- Caller phone number (parameter 'caller'): upon off-hook, the phone number of the caller is spelled by IBC. This feature is useful for telephone without display, because the calling number must be displayed.
- Forwarder (parameter 'forwarder'): in case a secretary gets calls for various managers, it is desired to know who was originally the called manager.
- Forwarder state (parameter 'forwarder-state'): the forwarder and the status of forwarder (manager) are announced: if the manager has got one active call, the manager is said to be busy. If the manager has DND active, the manager is said to be occupied.

```
CLI# ibc-user-configuration
CLI(ibc-user-config)# number { <name> | <main-number> }
CLI(ibc-number)#  off-hook-announcement  {caller  |  caller-forwarder  |
forwarder | forwarder-state | caller-forwarder-state | disable }
```

#### *2.2.9.1.6 Forwarder Screening*

A user who utilizes call forwards can prevent IBC from announcing his number to the recipient (if this one uses off hook announcement of forwarder).

```
CLI# ibc-user-configuration
CLI(ibc-user-config)# number { <name> | <main-number> }
CLI(ibc-number)# screen-forwarded-number { enabled | disabled }
```

#### *2.2.9.1.7 Call Waiting*

If one call is already active on a phone, by default, a second call destined to that phone is anyway sent by the IBC to the phone. In this case, the phone indicates that a call is waiting (special beep on FXS, LED or alarm message on LCD display for ISDN or SIP phones).

It is possible to forbid the call waiting feature. If a call is destined to a phone with disabled call waiting, the called party is considered by IBC as busy and the call is processed normally for a busy subscriber (for

example, forward to voice mail).

```
CLI# ibc-user-configuration
CLI(ibc-user-config)# number { <name> | <main-number> }
CLI(ibc-number)# call-waiting {enabled | disabled}
```

#### *2.2.9.1.8 Call Completion on Busy Subscriber*

CCBS is a service invoked as an ultimate step before forwarding a call to user voice mail if the called party is busy. Before asking if the calling user wants to leave a message in voice mail box, the caller is prompted to enter a digit to confirm he would like to be called. CCBS works when caller and called are internal subscribers.

Let us say A calls B and B is busy. A can activate automatic recall. A timer scans every minute if B is no longer busy. When B is no longer busy, A is called and he must pick up the phone within 30 seconds. IBC attempts to call A every minute. Then B is called. If A hooks on before B picks up, CCBS is cancelled. If B goes in DND mode or is no more reachable, CCBS is deactivated.

CCBS is active by default but can be disabled.

Restrictions:

- A and B are internal
- If C calls B while B is still busy and if A has already requested CCBS to recall, the CCBS service is not offered to C
- A is called because B is not busy. A picks up the phone but B placed another call in the meantime (so it is busy again), then A is directed to voice mail.

```
CLI# ibc-user-configuration
CLI(ibc-user-config)# number { <name> | <main-number> }
CLI(ibc-number)# ccbs {enabled | disabled}
```

#### *2.2.9.1.9 Call Forwarding*

Call Forwarding is a service automatically connecting incoming call to another number. There are several types of call forward:

- Call Forward Unconditional (CFU): the call is forwarded immediately to the configured extension. For example, during holiday, one can transfer a fixed line number to a mobile phone.
- Call Forward on Busy (CFB): if the extension is in busy state, the call is immediately forwarded to the configured extension.
- Call Forward on No Reply (CFNR): the called phone rings for a certain time period without being answered, then the call is forwarded.

To configure the call forward:

```
CLI# ibc-user-configuration
CLI(ibc-user-config)# number { <name> | <main-number> }
```

To activate/de-activate CFU (default: no cfu):

```
CLI(ibc-number)# { cfu <forwarded-to nbr> | no cfu }
```

To re-activate CFU (CFU must have been programmed previously):

```
CLI(ibc-number)# cfu
```

N.B.: CFU can be applied on a hunt group or an internal service (not CFNR/CFB).

To activate/de-activate CFB (default: no cfb):

```
CLI(ibc-number)# { cfb <forwarded-to nbr> | no cfb }
```

To activate/de-activate CFNR (default: no cfnr, timer = 15 s):

```
CLI(ibc-number)# { cfnr <forwarded-to nbr> [timer <timer>] | no cfnr }
```

To activate/de-activate CFDI (default: no cfdi):

```
CLI(ibc-number)# { cfdi <forwarded-to nbr> | no cfdi }
```

Scheduled CFU on a daily/weekly basis is possible. If follow-me, CFU and scheduled CFU is configured, scheduled CFU has the greatest priority.

```
CLI(ibc-number)# scheduled-cfu <day> <id> <hh>:<mm> <hh2>:<mm2>
<forwarded-to-nbr>
```

Where <day> is the day where the scheduled CFU is active (i.e.: Monday, Tuesday, ..., Sunday). <id> is the identifier of scheduled CFU time frame. <hh>:<mm> is the start-time and <hh2>:<mm2> is the end time. Time frames must not overlap.

To suppress a scheduled CFU:

```
CLI(ibc-number)# no scheduled-cfu <day> <id>
```

To reactivate one of the last programmed scheduled CFU:

```
CLI(ibc-number)# scheduled-cfu <day> <id>
```

One can configure a phone to reject forwarded calls. For example, A calls B. B has forwarded calls to C. C may refuse to receive such a forwarded call (default: accept forwarded calls):

```
CLI(ibc-number)# [no] forwarded-call
```

A series of call forwards can also happen; that is: A calls B forwarding call to C forwarding call to D... Although OneOS detects loops in call forwards, it might be desired to forbid call forwarding cascading. By default, multiple call forwards are allowed and if the last called person is busy, disconnected or not replying, the caller might be redirected to the voice mail of the first called number (default) or to the last called number. To allow multiple call forwards (default: enabled):

```
CLI(ibc-number)# second-forwarding { enabled | disabled }
```

In case of multiple call forwards and if the last called is not available, the voice mail of first or last called must be chosen:

```
CLI(ibc-number)# forward-to-voicemail {first | last}
```

For call forwarding sake, an alias to forward to the user's voicemail can be used. This alias is the same as the "call voicemail service" keypad, which is '888' by default. This alias is particularly useful with scheduled call forward, for your calls to reach your voicemail directly without ringing at times you are out of office.

#### *2.2.9.1.10 Follow-Me Service*

This service (also called 'reach-me' service) is a feature that tries to reach a mobile subscriber: he may be reachable on his fixed line, but also on his mobile phone or home office. The follow-me service instructs the IBC to try to reach the subscriber on a first extension (ex.: fixed line), then on 2nd number (his home office), then on a third one (mobile phone).

To configure the follow-me service:

```
CLI# ibc-user-configuration
CLI(ibc-user-config)# number { <name> | <main-number> }
CLI(ibc-number)# follow-me
CLI(ibc-follow-me)# number <1-3> <number> [<timer>]
```

By default, IBC waits for 15s (<timer> parameter) before trying the next number.

To suppress a number:

```
CLI(ibc-follow-me)# no number <1-3>
```

To suppress the follow-me service:

```
CLI(ibc-follow-me)# exit
CLI(ibc-number)# no follow-me
```

To re-activate the last programmed follow-me service:

```
CLI(ibc-number)# follow-me
CLI(ibc-number)# exit
```

#### *2.2.9.1.11 Call Pickup*

Call pickup is a service allowing an authorized user to intercept a call destined to another subscriber. The call-pickup feature functions as follows: A calls B, C hears B's phone ringing. C hangs up his phone and dials a specific dial pattern. As a result of call pickup feature, A is connected to C (instead of B; B's phone is no more ringing). Call-pickup is enabled by default.

```
CLI# ibc-user-configuration
CLI(ibc-user-config)# number { <name> | <main-number> }
CLI(ibc-number)# call-pickup { enabled | disabled }
```

#### *2.2.9.1.12 Do Not Disturb*

When the Do-Not-disturb feature is active, IBC plays a message for incoming calls destined to that user, or forwards to voicemail. Command:

```
CLI# ibc-user-configuration
CLI(ibc-user-config)# number { <name> | <main-number> }
CLI(ibc-number)# do-not-disturb { enabled | disabled }
```

### *2.2.9.2 Services for Outgoing Calls*

The CLIR (Calling Line Identity Restriction) is feature hiding the calling number in the network. CLIR is disabled by default.

```
CLI# ibc-user-configuration
CLI(ibc-user-config)# number { <name> | <main-number> }
CLI(ibc-number)# clir { enabled | disabled }
```

The alternate identity feature is used to display another number than yours when placing an external call. This alternate number must have been chosen before (please refer to section 2.2.7.3 Phone Number And Hunt Groups). Once done, you may activate this feature with:

```
CLI# ibc-user-configuration
CLI(ibc-user-config)# clip { std | alternate }
```

The directory service allows the definition of short dial numbers. A global directory is a list of short numbers available for all subscribers and a personal directory can also be configured by any subscriber.

To configure **global directory** numbers, first enter the following commands:

```
CLI# ibc-user-configuration
CLI(ibc-user-config)# global-directory
```

N.B.: there is no limitation on the number of entries in the global directory. Then, enter the full number:

```
CLI(ibc-global-dir)# full-number <1-20 digits>
```

Then enter a name (optional) and the short number:

```
CLI(full-number)# short-number <1-20 digits>
CLI(full-number)# name <string>
CLI(full-number)# exit
CLI(ibc-global-dir)# exit
```

To suppress an entry in global directory:

```
CLI(ibc-global-dir)# no full-number <full-number>
```

Personal directory is rather similar to global directory configuration. N.B.: there is no limitation on the number of entries in the personal directory. The same commands can be entered for every phone numbers:

```
CLI# ibc-user-configuration
CLI(ibc-user-config)# number { <name> | <main-number> }
CLI(ibc-number)# directory <short-number> <full-number> [ <name> ]
CLI(ibc-number)# no directory <short number>
```

#### *2.2.9.2.1 Entering/Exiting a Hunt Group*

The hunt groups are defined by the administrator under ibc-service. The administrator defines the membership of users to hunt groups. A user may decide not to be member of the group temporarily.

One can enter/exit a hunt group by means of the following commands:

```
CLI# ibc-user-configuration
CLI(ibc-user-config)# number { <name> | <main-number> }
CLI(ibc-number)# enter-group <main number of group>
CLI(ibc-number)# enter-all-group
CLI(ibc-number)# exit-all-group
CLI(ibc-number)# exit-group <main number of group>
```

### *2.2.9.3 Changing PIN Code*

The PIN code is the suite of digits dialed as password when querying voice mail or configuring some personal voice services (example: login). To change the PIN code per CLI:

```
CLI# ibc-user-configuration
CLI(ibc-user-config)# number { <name> | <main-number> }
CLI(ibc-number)# phone-password <old_password> <new_password>
```

### 2.2.10 Dial Command

This command calls first the desired user and if responding it connects the called user with the calling user. This command is the basis to build a click-to-dial function from a web page.

```
CLI# ibc dial <called-number> <calling-number>
```

### 2.2.11 Voice to email

The administrator must configure the smtp options and enable the voice to email service in the user configuration:

```
CLI(configure)# smtp local-email <email>
CLI(configure)# smtp local-name <local-name>
CLI(configure)# smtp auth-name <local-name>
CLI(configure)# smtp auth-password <local-name>
CLI(configure)# smtp server <smtp-server>
```

Then the voice to email service of a user must be authorized

```
CLI(configure)# Ibc-service
CLI(ibc)# Numbering-plan
CLI(ibc-index)# Index <id>
CLI(config-nbr)# Voice-to-email internal email-notify
```

Email address is set by this command:

```
CLI# ibc-user-configuration
CLI(ibc-user-config)# number { <name> | <main-number> }
```

```
CLI(ibc-number)#  email <email>
```

Voice to email is selected by:

```
CLI# ibc-user-configuration
CLI(ibc-user-config)# number { <name> | <main-number> }
CLI(ibc-number)#  voicemail internal email-notify [delete | no-attach]
```

### 2.2.12 Voicemail

Internal voicemail mode is set by :

```
CLI# ibc-user-configuration
CLI(ibc-user-config)# number { <name> | <main-number> }
CLI(ibc-number)#    voicemail internal [ responder-only | responder-
recorder ]
```

The mode 'responder-only' sets the voice mail in answering-machine mode, i.e. the system plays a message but will not record voice mail.

### 2.2.13 Overflow phone

An overflow phone is the phone that is contacted when a call to a user fails (no call forwards, no voicemail …etc). It is configured on a per user basis. Overflow phone is set by the command:

```
CLI# ibc-user-configuration
CLI(ibc-user-config)# number { <name> | <main-number> }
CLI(ibc-number)#  overflow <number>
```

### 2.2.14 Displayed number format

*NB: throughout this chapter, the examples used will refer to "33" as a country code, "0" as national code, "00" as international code.*

#### *2.2.14.1 Objective*

The displayed number format function is used to manage per-user the format of numbers, between the national format (e.g. 01…) International format (e.g. 00331…), plus format (e.g. +331….).

The administrator defines the three prefixes that will be used for the whole PBX:

- International prefix: to refer to an international call
- Country prefix: to refer to the country within an international number
- National prefix: to be used within the country

Each user afterwards can define the format of his incoming calls numbers:

- International numbers can be either displayed with "+" followed by the country code, or with the international prefix followed by the country code
- National numbers can be either displayed with "+" followed by the country code, or with the national prefix.

Each trunk can be configured by the administrator to send:

- International numbers either with "+" followed by the country code, or with the international prefix followed by the country code
- National numbers either with "+" followed by the country code, or with the national prefix.

### *2.2.14.2 Configuration*

Please refer to the user configuration for user's configuration of displayed number format.

Regarding the trunk configuration of the displayed number format:

```
OneOs# configure terminal
OneOs(conf)# ibc-service
OneOs(ibc)# external-trunk
OneOs(external-trunk)# trunk X
OneOs(trunk)# international-number-display-format <international|plus>
OneOs(trunk)# national-number-display-format <international|plus>
```

With:

**international** referring to: international-prefix // country-code // national-subscriber-number
**national** referring to: national-code // national-subscriber-number
**plus** referring to: + // country-code // national-subscriber-number

Regarding the definition of global prefixes for the whole PBX:

```
OneOs# configure terminal
OneOs(conf)# ibc-service
OneOs(ibc)# country-prefix <prefix>
OneOs(ibc)# international-prefix <prefix>
OneOs(ibc)# national-prefix <prefix>
OneOs(ibc)# exit
OneOs(conf)# exit
```

## 2.2.15 Debug and Statistics

To display the list of registered phones and the IP address they registered with, please enter the command:

```
CLI# show ibc user
Phone/User agent        IP address            Status    User name
7010/SJphone            192.168.16.6:5060     idle      Emperor Earth
7020/-                          -             forwarded
7001/-                          -             offline   John
7002/hunting-group              -             ready     Will
7011/-                          -             offline   Charlie
700/-                           -             offline
7021/-                          -             offline   Ted
7030/Aastra 480i        192.168.16.60:5060    idle      Portier
7300/-                           -                offline    Jean-Francois
Legrand
8000/legacy phone               -             idle      fxs
7080/THOMSON ST2030     192.168.16.61:5060    idle
9200/receptionist               -             ready     ivr
```

Note about the status:

- Idle: phone is registered, no call active and no call forward
- Offline: phone is unregistered
- Ready: phone number is in service (for internal services only)
- Busy: at least, one communication in progress

- Forwarded: the user activated CFU or scheduled CFU

To display information about a number:

```
CLI# show ibc user <main-internal>
```

Example:

```
CLI# show ibc user 7080
7080 is idle, sip user [11]
  privilege-level 1, service keypad 1
  service profile 0, install profile 1, call-restriction profile 1
  pickup on, dnd off, ccbs on, screened forward on, clir off
  off-hook-announcement off, ringing timeout 15
  SIP registered, expiry in 37 sec, codec order (alaw,g729)
  IP address 192.168.16.61:5060, MAC address 00:0e:50:4e:70:e1
  User agent THOMSON ST2030 hw3 fw1.54 00-0E-50-4E-70-E1
  IN:  1 calls received
       1 answered, 0 canceled, 0 busy, 0 not answered, 0 peer offline
  OUT: 1 calls made, 0 rejected, 0 not routable
       0 local calls, 0 external calls, 0 internal services
       1 answered, 0 canceled, 0 busy, 0 not answered, 0 peer offline
  Voicemail: off
```

To display IBC statistics:

```
CLI# show ibc statistics
IBC daemon is up since 08 NOV 2007 10:49 (03:03:13)
  SIP interface fastethernet 0/0, registration timer 30 sec, language en
  10 phones configured/limit 20, 1 hunting groups, 1 internal services
  5 phones registered: 5 idle, 0 busy
  0 active calls, 1 max calls reached/limit 10
  Trunk: 126 calls received, 6 not routable
         0 rejected (congestion)
         110 to local users, 0 to trunk, 10 to internal services
         90 established, 7 canceled, 2 busy, 10 not answered
         1 peer offline, 0 server-down
  Local users: 2258 calls received, 25 not routable
         0 rejected (congestion), 2 rejected (restriction-profile)
         1654 to local users, 446 to trunk, 131 to internal services
         2016 established, 84 canceled, 41 busy, 137 not answered
         12 peer offline, 0 server-down
  Voicemail: 3 messages (1 unread), 0 min 13 sec
         3435968 bytes (57 min 15 sec) left on flash disk for voicemail
```

Comments on IBC statistics:

- A maximum number of calls is supported (depends on product). For example, on ONE100 in the statistics above, no more than 10 simultaneous calls can be made. Additional calls will be dropped and the counter "max calls reached" will be incremented.
- The maximum number of external calls on a trunk interface is also limited. Calls dropped because of trunk capacity limitation are counted in the "rejected (congestion)" counter.
- In trunk statistics, the "to trunk" counter designates incoming external calls that are looped to another external called party. (tromboned call).
- Restriction profiles: every user can be associated with an outgoing call restriction profile. This profile defines number patterns that can be called or not (e.g. to forbid dialing to toll phone services).
- Voicemail: the number of bytes represents the space that is effectively available for voice mail. This is not the whole flash space (a margin is taken).

To display global call statistics

```
One100_IBC> show ibc statistics {global | phone <number> | trunk <id> }
```

Examples:

```
One100_IBC> show ibc statistics phone 7010
Phone 7010:
```

```
  IN:  256 calls received
       244 answered, 4 canceled, 0 busy, 8 not answered, 0 peer offline
  OUT: 189 calls made, 0 rejected, 0 not routable
       45 local calls, 134 external calls, 12 internal services
       161 answered, 11 canceled, 0 busy, 17 not answered, 0 peer offline
  Voicemail: 1 messages (1 unread)/max 20, 13 seconds/max 180
```

To display SIP statistics

```
CLI#  show ibc statistics sip
SIP listening on 192.168.16.250:5060 using internal sip proxy
  IN:  323 messages, 0 too short, 0 malformed
       301 requests, 0 unknown
         125 REGISTER, 170 OPTIONS, 0 NOTIFY, 0 REFER
         2 INVITE, 0 CANCEL, 2 BYE, 0 INFO, 0 MESSAGE
         2 ACK, 0 PRACK, 0 SUBSCRIBE, 0 UPDATE, 0 PUBLISH
       22 responses, 0 unknown, 0 wrong
         10 1xx, 12 2xx, 0 3xx, 0 4xx, 0 5xx, 0 6xx
  OUT: 444 messages
       16 requests, 0 unknown
         0 REGISTER, 0 OPTIONS, 0 NOTIFY, 0 REFER
         6 INVITE, 0 CANCEL, 2 BYE, 0 INFO, 0 MESSAGE
         8 ACK, 0 PRACK, 0 SUBSCRIBE, 0 UPDATE, 0 PUBLISH
       428 responses, 0 unknown
         129 1xx, 129 2xx, 0 3xx, 170 4xx, 0 5xx, 0 6xx
```

To reset the statistical counters of SIP, run

```
CLI#   clear ibc sip counters
```

To reset the global statistical counters of IBC, run

```
CLI#   clear ibc statistics
```

To reset the statistical counters of all users, run

```
CLI#   clear ibc user
```

To reset the statistical counters of a specific user, run

```
CLI#  clear ibc user 7010
```

To display all unconditional call forwards set to a number:

```
CLI# show ibc cfu-to <number>
```

To display information about trunks:

```
CLI# show ibc trunks
```

The following events are notified through system log facility, IBC server daemon shutdown and restart local phone registration and unregistration file system full (failure to save voicemails)

The following is a sample output:

```
12:09:13.194 #INFO# IBC: phone 7030 registered at 192.168.16.60:5060
12:09:16.274 #INFO# IBC: phone 7080 registered at 192.168.16.61:5060
12:09:30.581 #INFO# IBC: phone 7010 registered at 192.168.16.6:5060
12:58:40.695 #INFO# IBC: phone 7010 unregistered upon timeout
13:02:38.270 #INFO# IBC: phone 7010 registered at 192.168.16.6:5060
```

The event log is enabled by default. To disable the event log for IBC server, run:

```
CLI> configure terminal
CLI(configure)> ibc-service
CLI(ibc)> [no] log events
```

To debug an IBC call, use the debug command:

```
CLI# debug ibc call
```

The following is the output trace when the local phone 7080 calls a 7002 which is a hunting group.

```
13:17:16.868 IBC: [5] new call 7080->7002 received from user
13:17:16.966 IBC: [5] call 7080->7002 hunting group 1
13:17:17.131 IBC: [5] call 7080->7010 dialing 7010
13:17:17.142 IBC: [5] call 7080->7011 phone offline
13:17:17.150 IBC: [5] call 7080->7021 dialing 7021
13:17:23.929 IBC: [5] call 7080->7010 in conversation
13:17:53.823 IBC: [5] call 7080->7010 hung up
```

To enable the debug trace of call flow for a specific phone, run

```
CLI# debug ibc phone 7010
```

Whenever a configuration is done (changing a service for a user, adding/removing a phone number ...), a trace of the change is displayed by means of the next command:

```
CLI# debug ibc config
```

To enable the debug trace of the IVR service, run:

```
CLI# debug ibc ivr
```

To enable the debug trace of the voicemail service, run:

```
CLI# debug ibc voicemail
```

To de-activate all debug traces:

```
CLI# no debug
```

### 2.2.16 Configuration Example

The following example is for an ONE300 with a BRI trunk on port 5/4 an FXS subscriber on port 5/2 and 3 SIP phones. The BRI port simulates the public network, but it is configured in NT mode for connection with an ISDN phone, rather than a connection a public network.

; ONE300 with BRI 5/4 FXS 5/2

```
! Built on One300
event filter add vox  all show
configure terminal
hostname vxTarget
interface FastEthernet 0/0
 ip address 192.168.1.10 255.255.255.0
exit
interface Loopback 1
 ip address 192.168.16.250 255.255.255.255
exit
interface bri 5/4
 isdn
  application-interface voip
  protocol-emulation isdn-nt
 exit
 no shutdown
 execute
exit
ip dhcp pool LAN
 network 192.168.1.100 255.255.255.240
 default-router 192.168.1.10
 dns-server 192.168.1.10
exit
dial-peer voice pots 0
 pots-group 0
```

```
 port 5/4
 no shutdown
exit
dial-peer voice pots 10
 pots-group 10
 port 5/2
 no shutdown
exit
dial-peer voice voip 0
 sig-protocol sip
 voip-coder-profile 0
 sip-ua ip-static ibc
 no shutdown
exit
voice-routing
 route 1
  dial-peer pots-group 0
  prefix .  length 0
  prefix-type incoming calling last
  insert-prefix #98 calling
  no loopback-routing
 exit
 route 2
  dial-peer pots-group 0
  prefix #98.  length 3
  prefix-type outgoing called last
  suppress-prefix 3 called
  no loopback-routing
 exit
 route 3
  dial-peer voip 0
  prefix .   timer
  prefix-type outgoing called last
  no loopback-routing
 exit
exit
sip-gateway
 shutdown
exit
sip-server
 interface loopback 1
 no shutdown
exit
ibc-service
 external-trunk
  trunk 1
   trunk-name BRI
   dial-prefix 0
   routing-prefix #98
   trunk-type sip
  exit
 exit
 numbering-plan
  index 1
   main-number 9000
   alternate-number 6000
   main-external 0198759000
   alternate-external 0198756000
   name SIP1
   service-keypad 1
  exit
  index 2
   main-number 9001
   alternate-number 6001
   main-external 0198759001
   alternate-external 0198756001
   name SIP2
   service-keypad 1
```

```
  exit
  index 3
   main-number 9002
   alternate-number 6002
   main-external 0198759002
   alternate-external 0198756002
   name SIP3
   service-keypad 1
  exit
  index 10
   main-number 8000
   alternate-number 5000
   main-external 0198758000
   alternate-external 0198755000
   name FXS1
   number-type legacy-subscriber pots-group 0
   service-keypad 1
  exit
 exit
 sip-proxy internal
 interface fastethernet 0/0
 no shutdown
exit
tftp-server address fastethernet 0/0
exit
```